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Tongass
National
Forest

R10-MB-312

January 1996



Upper Carroll Timber Sale

Draft Environmental Impact Statement

Summary

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ACRONYMS AND SYMBOLS

ADF&G	Alaska Department of Fish and Game
AHMU	Aquatic Habitat Management Unit
ANCSA	Alaska Native Claims Settlement Act
ANILCA	Alaska National Interest Lands Conservation Act
ASQ	Allowable Sale Quantity
BBF	One billion board feet
BMP	Best Management Practice
CEQ	Council on Environmental Quality
CFL	Commercial Forest Land
CFR	Code of Federal Regulations
CZMA	Coastal Zone Management Act of 1976
DBH	Diameter at Breast Height
DEIS	Draft Environmental Impact Statement
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
EVC	Existing/Expected Visual Condition
FEIS	Final Environmental Impact Statement
FSH	Forest Service Handbook
FSM	Forest Service Manual
GIS	Geographic Information System
IDT	Interdisciplinary Team
KPC	Ketchikan Pulp Company
KV	Knutsen-Vandenberg Act
LTF	Log Transfer Facility
LUD	Land Use Designation
LWD	Large Woody Debris (same as LOD)
MBF	One thousand board feet
MELP	Multi-Entry Layout Process
MIS	Management Indicator Species
MM	Maximum Modification
MMBF	One million board feet
NEPA	National Environmental Policy Act
NFMA	National Forest Management Act
NMFS	National Marine Fisheries Service
NOI	Notice of Intent
P	Primitive
PR	Partial retention
R	Retention
RM	Roaded modified
RN	Roaded natural
ROD	Record of decision
ROS	Recreation Opportunity Spectrum
SHPO	State Historic Preservation Officer
SPM	Semi-primitive motorized
SPNM	Semi-primitive nonmotorized
TLMP	Tongass Land Management Plan
TRUCS	Tongass Resource Use Cooperative Survey
TTRA	Tongass Timber Reform Act
USDA	United States Department of Agriculture
USDI	United States Department of the Interior
USFWS	United States Fish and Wildlife Service
VCU	Value Comparison Unit
VQO	Visual Quality Objective
WAA	Wildlife Analysis Area

Acknowledgements

Front cover: By Cindy Ross Barber, 1992. The design illustrates the range of interconnected issues addressed in the EIS.



United States
Department of
Agriculture

Forest
Service

Region 10

Tongass National Forest
Ketchikan Area
Federal Building
Ketchikan, AK 99901

Reply to: 1950

Date: January 9, 1996

Dear Reader:

Enclosed is the Draft Environmental Impact Statement (EIS) for the Upper Carroll Project Area.

If you received a complete set of documents, the following items should be found in the package:

1. Executive Summary
 2. Draft Environmental Impact Statement (Volume I)
 3. Draft EIS Appendices A - K (Volume II)
 4. Large scale color Project Area Map of Existing Condition
- Note that 11" x 17" maps of each alternative are included in Chapter 2 of of the DEIS (Volume I).

If you elected to receive the summary only, you will find 11" x 17" alternative maps bound into the back of the document as well as a large-scale Project Area Map (Existing Condition Map) included with the summary.

You are encouraged to review and comment on the Draft EIS. Written comments must be received by **March 9, 1996**. Comments should be addressed to:

Forest Supervisor
Ketchikan Area
Tongass National Forest
Attn: Upper Carroll EIS
Federal Building
Ketchikan, AK 99901

Subsistence hearings will be held in Saxman and Ketchikan. Each subsistence hearing will be preceded by an open house to answer questions you may have. The schedule of hearings and open houses is as follows:



Caring for the Land and Serving People



Upper Carroll DEIS (continued)

Page 2

Date	Open House Time	Subsistence Hearing Time	Community	Location
February 22	6-7:00 pm	7-9:00 pm	Ketchikan	Westmark Cape Fox
February 23	6-7:00 pm	7-9:00 pm	Saxman	City Hall

I encourage you to take the time to review and comment on the Draft EIS, as well as to participate in the subsistence and public hearings. Your input will be used to prepare the Final EIS and the Record of Decision. Your interest in the management of the Tongass National Forest is appreciated.

Sincerely,

BRADLEY E. POWELL
Forest Supervisor

Enclosures



Draft Environmental Impact Statement

Upper Carroll Timber Sale

**United States Department of Agriculture
Forest Service—Alaska Region
Alaska**

Lead Agency: U.S.D.A. Forest Service
Tongass National Forest
Ketchikan Administrative Area

Responsible Official: Forest Supervisor
Ketchikan Administrative Area
Tongass National Forest
Federal Building
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**For Further Information
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Ketchikan, Alaska 99901
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Abstract

The USDA Forest Service proposes to harvest up to approximately 70 million board feet (MMBF) of timber in the Upper Carroll Project Area, Ketchikan Ranger District, Ketchikan Administrative Area, Tongass National Forest. Timber volume would be offered to the Ketchikan Pulp Company (KPC) under the KPC Long-term Timber Sale Contract (A10fs-1041) and/or the Ketchikan Area independent timber sale program. The actions analyzed in this EIS are designed to implement direction contained in the Tongass Land Management Plan (TLMP, 1979a, as amended) and the Tongass Timber Reform Act. The EIS describes five alternative which provide different combinations of resource outputs and spatial locations of harvest units. The alternatives include: 1) No Action, proposing no new harvest from the Project Area at this time; 2) configure harvest units to provide the maximum amount of timber within Forest Plan standards and guidelines; 3) configure harvest units to emphasize timber sale economics and conventional cable yarding methods; 4) configure harvest units to emphasize wildlife habitat and maintain the integrity of large unfragmented blocks of old-growth forest; and 5) configure harvest units to emphasize a positive net economic return, while seeking to strike a balance between competing resource uses.

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Summary

Key Terms

Alternative - one of several policies, plans, or projects proposed for decision making.

Allowable Sale Quantity (ASQ) - the maximum quantity of timber that may be sold each decade from a national forest.

BMPs - Best Management Practices - practices used for the protection of water quality.

Land Use Designation (LU D) - method of classifying land uses allocated by the Forest Plan.

MMBF - million board feet.

Management Area - an area for which management direction was written in the Forest Plan (TLMP 1979a, as amended 1986) management areas encompass one or more Value Comparison Units (VCUs).

Old-growth Forest - an ecosystem distinguished by old trees and related structural attributes. Old-growth forests encompass the latter stages of stand development. They typically differ from earlier stages of stand development in a variety of characteristics which may include tree size, accumulation of large dead woody material, number of canopy layers and tree species composition, and ecosystem function.

Primary Sale Area (PSA) - the KPC Long-term Sale Contract is comprised of Allotments E, F, G, and the Rest of Areas E, F, and G. For the purposes of this EIS, Allotments E, F, and G constitute the Primary Sale Area and the Rest of Areas E, F, and G constitute Contingency Sale Areas.

Scoping Process - activities used to determine the scope and significance of a proposed action, what level of analysis is required, what data is needed, and what level of public participation is appropriate.

Subsistence - the customary and traditional uses by rural Alaskan residents of wild renewable resources for direct personal or family consumption and for customary trade.

Tongass Land Management Plan (TLMP) - the 10-year land allocation plan for the Tongass National Forest—TLMP was completed in 1979 and was amended in 1986 and again in 1991 (TLMP 1979a, as amended). TLMP is currently undergoing revision; a Supplement to the Revision Draft Environmental Impact Statement was issued in 1991. Until the Revision is completed, the TLMP, as amended, remains in effect (TLMP Draft Revision 1991a).

Value Comparison Unit (VCU) - areas which generally encompass a drainage basin to provide a common set of areas where resource inventories could be conducted and resource interpretations made.

Introduction

In compliance with the National Environmental Policy Act (NEPA) and other relevant State and Federal laws and regulations, the Forest Service has prepared this Environmental Impact Statement (EIS) on the effects of timber harvest in the Upper Carroll Project Area (Figure S-1) on Revillagigedo Island of the Ketchikan Administrative Area, Tongass National Forest. The proposed action would make up to approximately 70 million board feet (MMBF) of timber available to the Ketchikan Pulp Company (KPC) under its Long-term Timber Sale Contract with the Forest Service (Ketchikan Pulp and Paper Co. 1951, as amended in 1991), and/or the Ketchikan Area independent timber sale program. The actions analyzed in this EIS are designed to implement direction contained in the Tongass Land Management Plan (TLMP 1979a, as amended) and the Tongass Timber Reform Act. They also propose management consistent with the preferred alternative (Alternative P) in the TLMP Draft Revision Supplement (TLMP Draft Revision 1991a). The EIS discloses the direct, indirect, and cumulative environmental impacts and any irreversible or irretrievable commitment of resources that would result from each proposed alternative.

Public Participation in the Decision-making Process

Public involvement in the process began formally on August 30, 1994 with the mailing of a scoping package to individuals, government agencies, Native corporations, and interested organizations describing the proposed action and inviting public comment on the scope of the issues and areas of major concern to be addressed by the environmental analysis. Announcements about the project were printed in the Island News, Wrangell Sentinel, Sitka Sentinel, Petersburg Pilot and Juneau Empire. A scoping document describing the project was placed in the September 3, 1994 weekend edition of the Ketchikan Daily News. A Notice of Intent (NOI) to prepare an EIS was published in the Federal Register on August 31, 1994. Public scoping meetings were held in Ketchikan on October 4, 1994 and in Saxman on October 5, 1994. Individual consultations were held from October 1994 through August 1995 with local, state, federal and tribal government agencies.

Subsistence hearings on the Draft EIS will be held in Ketchikan and Metlakatla. Open Houses will be held in conjunction with the subsistence hearings to discuss the analysis process and answer public questions on the Draft EIS. Public comment on the Draft EIS will also be accepted at that time. Comments will be recorded and transcribed.

Release of the Draft EIS triggers a minimum 45-day public comment period. The period for public comment on this Draft EIS and the deadline for receipt of written comments are noted in the cover letter accompanying this document and will be publicized in the local media. Written comments on the EIS can be mailed to:

Forest Supervisor
ATTN: Upper Carroll EIS
Tongass National Forest
Federal Building
Ketchikan, AK 99901

Decision to be Made

Based on the information contained in this EIS, the Forest Supervisor will decide to (1) select one of the alternatives presented in the Final EIS, (2) modify an alternative as long as the environmental consequences of the modified action have been analyzed within the Final EIS, or (3) reject all alternatives and request further analysis. If an alternative is selected, it will be documented in the Record of Decision (ROD).

Purpose and Need for Action

The purpose and need for action is two-fold. First, it is to provide timber volume that will contribute to a 3-year current timber supply for the KPC contract (Section B0.61) and/or to the Ketchikan Area Independent Timber Sale Program; for this project that volume is approximately 70 MMBF. Second, it is to move toward the desired future condition as identified in the Tongass Land Management Plan (TLMP 1979a, as amended) and in the Tongass Land Management Plan (TLMP) Draft Revision (TLMP 1991a). This desired condition is described in the current Forest Plan under the Management Direction/Emphasis for each management area.

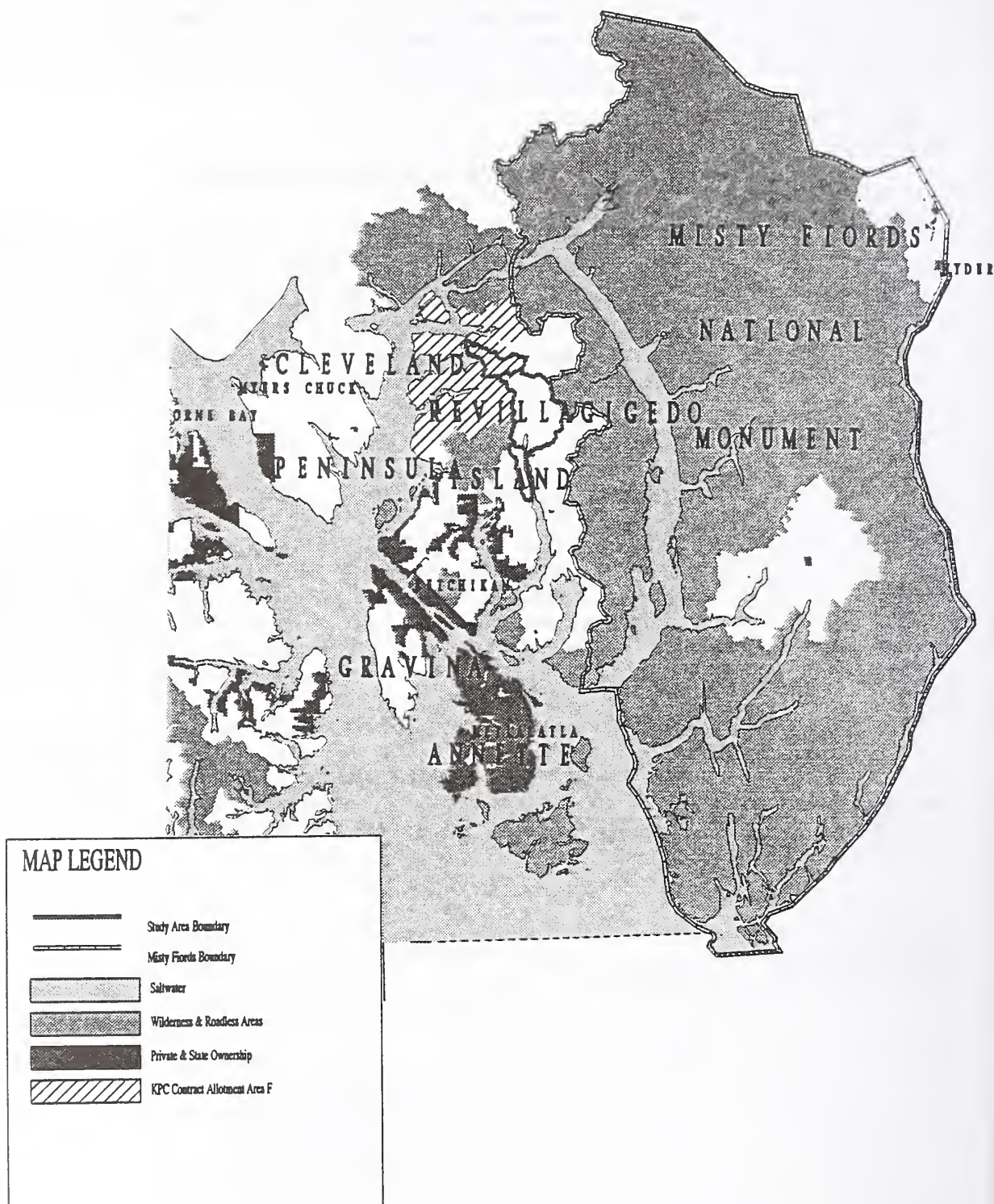
Project Area

The 47,942 acre Upper Carroll Project Area is located approximately 30 air miles northeast of Ketchikan, Alaska (Figure Sum-1). It encompasses an area of northcentral Revillagiedo (Revilla) Island that extends from the head of Carroll Inlet north to Neets Bay. It includes the drainages associated with Neets Creek and Carroll Creek. There are no communities within or adjacent to the Project Area. Access to the Project Area is by floatplane or boat, generally originating in Ketchikan.

The Project Area includes Tongass Land Management Plan (TLMP 1979a, as amended) Management Area K32 (West Revilla) and Management Area K35 (Carroll-Thorne). The West Revilla Management Area includes value comparison units (VCUs) 737 and 744. The Carroll-Thorne Management Area includes a small portion of VCU 746. VCU boundaries generally follow major watershed divides with a few minor exceptions.

Summary

Figure Sum-1
Project Vicinity Map



The 47,997-acre Project Area is located approximately 30 miles northeast of Ketchikan. It encompasses an area of northcentral Revillagigedo (Revilla) Island, from the head of Carroll Inlet north to Neets Bay.

Background

KPC Long-Term Contract

The Forest Service signed a Long-term Timber Sale Contract with Ketchikan Pulp Company on July 26, 1951, authorizing KPC to purchase up to approximately 8.25 billion board feet (BBF) of timber throughout the contract area. Under the terms of the contract, modified in 1991, the Forest Service is required to "develop a tentative Offering Schedule...[which] shall list sufficient timber volume and schedule commencement of the NEPA process...to provide [KPC] a Current Timber Supply sufficient for at least three years of operations..." Further, the Forest Service is required to "seek to specify sufficient Offerings to maintain a Current Timber Supply in all Offering areas that total at least three years of operations...and which meet the production requirements of [KPC's] manufacturing facilities."

A 3-year supply of timber for KPC's operations under the contract is currently estimated to range from 556.2 to 557.5 MMBF. As of June 1, 1995, KPC had a current timber supply of approximately 193 MMBF. The maximum volume of timber that can be provided to KPC from within the contract area in the remainder of fiscal year 1995 and during 1996 and 1997, is about 423 MMBF. The timber supply remaining at the end of 1995, 1996, and 1997 would fall well short of meeting the objective of specifying a 3-year supply for operations under the contract, considering on-going harvest at either maximum or historic rates.

The Forest Service has made efforts to accelerate the preparation of new offerings within the contract area. However, because of the amount of time required to prepare new offerings in accordance with applicable laws, none of this volume is projected to be available until after fiscal year 1997. It remains to be seen how much of the volume in preparation will be cleared through the NEPA process and when it will be available.

Consequently, additional timber from outside the KPC contract area is needed in order to meet the 3-year timber supply objective. Sale offerings currently scheduled, undergoing NEPA evaluation, or at some other stage in the preparation process are projected to be needed to help meet the KPC Long-term Contract and Independent Sale Program's three year supply objectives. If any independent sales were converted to KPC contract offerings, equivalent volume currently planned for KPC contract offerings would then need to be substituted as independent sale offerings. The first offerings from the Upper Carroll Project Area could be made available in 1997 to help meet either 3-year supply objective.

Why the Upper Carroll Project Area was Selected

In accordance with the background described above, the Upper Carroll Project Area was selected for environmental analysis for the following reasons:

- Earlier NEPA actions evaluating or authorizing timber harvest are already active throughout the KPC contract PSA. Withdrawal of lands within the PSA through legislative action (e.g., Tongass Timber Reform Act) has also reduced the availability of timber. Beginning with the Polk Inlet Project, the Forest Service moved to the next step as stipulated in the KPC contract, namely harvest in "additional cutting areas" outside the PSA. The Upper Carroll Project Area is partially within the PSA (VCU 737), but is located primarily within the contingency area (VCU 744 and 746). The Project Area contains a sufficient amount of harvestable timber volume under the Forest Plan. Available information indicates that harvest of the amount of timber being considered for this project can occur within the Forest Plan (TLMP 1979a, as amended; TLMP 1991a) standards and guidelines.

Summary

- Other areas with available timber inside the contract area have or will be scheduled for harvest during the remainder of the KPC contract term. The sequence in which these areas are harvested would cause little difference in the effect on subsistence resources. Harvesting other areas on the Tongass National Forest would likely have similar potential effects on resources, including those used for subsistence, because of the widespread distribution of subsistence use. Harvest within these other areas is probable, in any case, over the forest planning horizon under either the existing or Draft Revision Forest Plan.
- It is reasonable to schedule harvest in the Upper Carroll Project Area now rather than in other areas in terms of:
 - previous harvest entry and access;
 - effects on subsistence; and
 - ability to complete the NEPA process and make timber available to contribute to the Ketchikan Area's Forest Plan timber program, including KPC contractual requirements, by the time it is reasonably necessary to do so.

For additional details on why the Upper Carroll Project Area was selected, see Appendix A in Volume II.

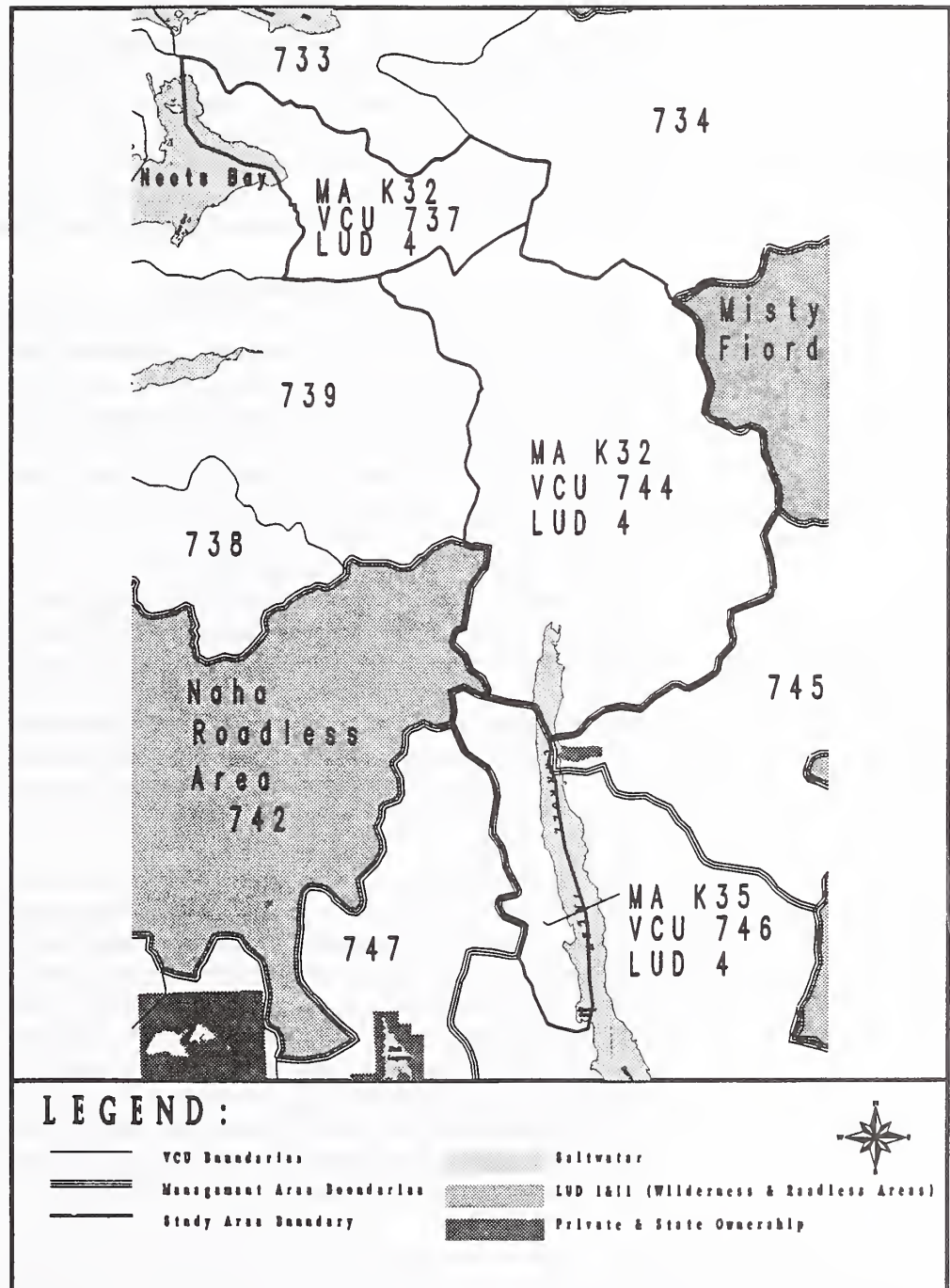
Relationship to Forest Plan

The National Forest Management Act of 1976 (NFMA) directs each National Forest to prepare an overall plan of activities. The Forest Plan provides land and resource management direction for the Forest. It establishes Land Use Designations (LUDs) to guide management of the land for certain uses. The LUDs describe the activities that may be authorized within the Value Comparison Units (VCUs), the boundaries of which usually follow easily recognizable watershed divides.

For the Tongass National Forest, the Forest Plan is the TLMP of 1979, as amended in 1986 and again in February 1991 as a result of the Tongass Timber Reform Act (TTRA). The Forest Plan currently is undergoing revision as required by the NFMA. A supplement to the TLMP Draft EIS (the Draft Revision) was issued in 1991 (TLMP 1991a). Until the Record of Decision (ROD) for the Draft Revision is signed, the TLMP (TLMP 1979a, as amended) remains in effect. References in this document to the TLMP Draft Revision mean Alternative P of the Revision Supplement to the Draft EIS, unless otherwise noted. Figure Sum-2 displays the VCUs, Management Areas, and LUDs defined by the TLMP (1979a, as amended).

The Upper Carroll EIS tiers to the TLMP EIS (TLMP 1979a, as amended) and the Alaska Regional Guide EIS (1983). It also proposes management consistent with the preferred alternative (Alternative P) standards and guidelines in the TLMP Draft Revision (TLMP 1991a). In some cases, it incorporates documented analysis from TLMP or the TLMP Draft Revision by reference (40 Code of Federal Regulations [CFR] 1502.21) rather than repeating it in this EIS. In cases of conflicting land use designations, the most restrictive standards and guidelines were applied.

Figure Sum-2
Management Area and VCU Boundaries



Issues

The significant public issues, management concerns, and resource opportunities identified through the public and internal scoping process were used to formulate issue statements. Some of these issues were raised by the public and some reflect Forest Service concerns. Similar issues and concerns were grouped when appropriate.

Issues 1-8 were determined to be significant and within the scope of the project. All these issues will be addressed in all alternatives. Issues A-G were considered but eliminated from detailed study because their resolution falls outside the scope of the Upper Carroll project.

Significant Issues

Issue 1: Timber Economics

The timber issue addresses public concern for the amount of timber proposed for harvest and for economical entry into new stands while maintaining or enhancing resource values.

Issue 2: Fish Habitat and Water Quality

This issue addresses public concern for maintaining water quality in streams which provide suitable habitat for anadromous and resident fish. Fish and shellfish within the Upper Carroll Project Area are important to sport, commercial, and subsistence users throughout Southeast Alaska. The Southern Southeast Alaska Regional Aquaculture Association (SSARAA) operates a fish hatchery at Neets Bay under special use permit from the Forest Service. This issue also includes concerns about timber harvesting on steep slopes, mass movement of soil, stream temperature sensitivity, as well as karst and cave protection.

Issue 3: Recreation and Scenic Quality

Forest management activities could affect existing recreational pursuits for users of the Upper Carroll Project Area. More specifically, increased human access, timber harvest, and other developments could affect recreation values and opportunities including: hunting, fishing, scenic quality, and existing recreation facilities. Comments mentioned the importance of protecting the visual quality along inlets and bays. Other aspects of this issue were related to the visual impacts to flight-seeing, the visual appearance along the proposed Swan Lake-Lake Tyee Powerline intertie route, and potential impacts, if any, to Misty Fiords.

Issue 4: Wildlife

This issue includes concerns over several wildlife species and the habitats critical to the maintenance of those wildlife populations; Alaskan fish and wildlife are valuable for aesthetic, economic, recreational, ecological, and subsistence purposes. Of primary concern are the effects of timber harvest and associated road construction upon wildlife species dependent on old-growth habitat. There is also a concern regarding the proportion of Volume Classes 6 and 7 remaining after harvest in each management area. The long-term disposition of previously mapped old-growth areas (commonly referred to as retention areas) in the Project Area was identified as part of this issue. Related to the overall concern is the question of whether timber harvest operations would further fragment existing large blocks of old-growth habitat and result in declines in biological diversity. The need for a project specific old-growth habitat strategy that ties into a larger scale habitat strategy was also identified.

On July 27, 1995, the President signed Public Law 104-19 into effect. This law restricts the Forest Service from implementing HCAs, except for HCAs up to 300 acres in size around active goshawk nests. To fully address the wildlife and biodiversity issue, the effects on identified HCAs are described in this EIS.

Issue 5: Subsistence

Primary concern is for the potential effect, as well as the cumulative effects of timber harvest and road construction, upon the abundance and distribution of subsistence resources. For many, subsistence consists of hunting, fishing, trapping, and gathering to supplement their food sources, income, and other needs. For Southeast Alaska's Natives, it is a way of life directly related to preserving their culture and traditions. The Alaska National Interest Lands Conservation Act (ANILCA) specifically requires the Forest Service to determine if the proposed activities may significantly restrict subsistence use. Other aspects to be evaluated are competition from non-rural subsistence users and access to the resources.

Issue 6: Transportation/Utility Corridor

The State of Alaska (Alaska Energy Authority) recently completed a feasibility study for the utility/transportation corridor located partially within the Project Area. Ketchikan Public Utilities has awarded a contract to Foster Wheeler Environmental Corporation to complete an EIS for the proposed electrical intertie from Swan Lake to Lake Tyee. The preliminary preferred route includes approximately 30 to 40 miles within the Upper Carroll EIS study area. The two proposed actions appear to be connected actions because of the potential road locations and opportunity for cooperative agreements. The similar time lines make the issue ripe for a decision as well. The degree to which each alternative could contribute to a potential transportation/utility link will be documented in the EIS.

Issue 7: Social and Economic Effects

This issue reflects concerns about effects on community employment and income, population, community stability, and lifestyles. The economies of most communities in Southeast Alaska depend almost exclusively on the Tongass National Forest to provide natural resources for uses such as fishing, tourism, recreation, timber harvesting, mining, and subsistence. Many Southeast Alaskans want to maintain the natural environment which makes their lifestyle unique. At the same time, they want to continue maintaining their economic livelihood.

Issue 8: Marine Environment

The marine waters and their associated mud flats and estuaries found in protected coves and bays within the Project Area provide habitat for species such as Dungeness crab and juvenile salmon. Since coves and bays are the points of concentrated activity associated with marine transport of logs, logging camps, and sort yards, some marine species are subject to effects from log transfer and storage facilities. Four potential or existing Log Transfer Facility (LTF) sites are under consideration in the alternatives.

The following public issues were considered but eliminated from detailed study because their resolution is beyond the scope of this document.

Issue A: Land Use Designations

This issue focuses on the stated desire of some commentators to change TLMP Land Use Designations to eliminate, reduce, or increase the level of harvest and/or maximize specific resources. Land use allocation is a Forest planning issue. The current Forest Plan is under

Summary

revision and provides a forum for people who wish to see the area managed in a manner that differs from the current direction.

Issue B: Bradfield Road Transportation Link

Some members of the public expressed a concern that the Bradfield Road Transportation Link be evaluated in whole or in part in this EIS. The Bradfield road connection (excluding Revillagigedo Island) is not a connected or reasonably foreseeable action that is ripe for a decision. The portion of the proposed transportation link located within the Project Area that could be influenced by the proposed activities will be addressed.

Issue C: Development Outside the Project Area

Comments regarding the general level of development outside the Project Area are not considered issues ripe for decision under the Upper Carroll EIS. These areas include Cleveland Peninsula, Prince of Wales Island, and Orchard Creek (including Orchard Lake).

Issue D: Below Cost Timber Sales

Below-cost timber sales are a national issue and not within the scope of this project. The financial impacts of the alternatives, based on a mid-market analysis, are displayed in Chapter Three in this EIS.

Issue E: Timber Supply and Demand

Timber supply and demand is a regional issue and exceeds the scope of this analysis. A site-specific environmental analysis documents the effects of the proposed activities; it does not constitute the selling or conveyance of property rights. The volume of timber cleared in any NEPA document may be offered (sold) in part, in whole, or not at all.

The timber offered for sale (timber offerings) may occur in one year or be spread over a three- to five-year period. Trying to predict the effects of the proposed activities upon the regional timber supply or demand is, therefore, beyond the capability and scope of this document.

Issue F: Manage Upper Carroll for Sustained Yield

The National Forest Management Act (NFMA) directs that a sustainable level of harvest be identified for each National Forest. A sustainable level of harvest is one in which the level of harvest is equal to or less than the rate of growth over a period of time (ten years in the case of NFMA). There is no direction or intent to establish a sustainable level of harvest for individual project areas or small geographic subdivision of the Forest.

Issue G: Wild and Scenic Rivers

Several comments were received requesting that Carroll Creek be managed as a wild and scenic river. This is a Forest Planning issue. Carroll Creek was thoroughly analyzed for Wild and Scenic River eligibility as a part of previous Forest planning efforts. Carroll Creek was analyzed as part of the TLMP Revision to determine if it was eligible to be included under the Wild and Scenic Rivers Act. That analysis determined that no segment of the Carroll Creek was eligible for inclusion under the Wild and Scenic Rivers Act.

Development of Alternatives

Each action alternative presented in this EIS is a different response to the significant issues discussed in Chapter One. For this EIS, four action alternatives were developed to meet the stated purpose and need of the project, while minimizing or avoiding environmental impacts. Each action alternative represents a site specific proposal developed through intensive interdisciplinary unit and road design using high resolution topographic maps, GIS mapping capabilities, and aerial photos coupled with resource inventories and site inspections.

The alternative formulation process has been guided by several concepts and principals of sound resource management. Each alternative follows the standards, guidelines, and direction contained in the TLMP, the Alaska Regional Guide, and applicable Forest Service manuals and handbooks. Because of the possibility that the timber volume may be used to satisfy part of the contractual requirements of a long-term timber sale contract, they are also designed to meet the requirements of the Tongass Timber Reform Act (TTRA).

Ecosystem Management

Ecosystem management is a concept incorporated into forest management in recent years. The philosophy is to emphasize ecological, physical, and social sciences to guide resource management to sustain the health, productivity, and intangible values of the land. These concepts were considered in the selection and design of individual harvest units and roads included in the alternatives.

Ecosystem management looks at forest management on two levels: (1) the landscape level, which may be a geological province (geoprovince) or a large watershed; and (2) the stand level, which deals with individual harvest units. The forest plan incorporates ecosystem management at the landscape level through land use allocation and the development of Standards and Guidelines. This separates incompatible uses and spreads impacts out over time and space. Many issues—such as maintaining large unfragmented blocks of old growth over time and maintaining the connectivity between those blocks—can only be resolved over the entire rotation through the land use allocation or forest planning process. A site-specific project level plan evaluates the assumptions made in a higher level plan. It then implements that direction and responds to public comments through the development of alternatives which determine which stands are treated and how they are managed. Some tools employed at the stand level may include a deferred entry, reducing harsh edges through unit placement, looking for opportunities to retain small patches of uncut timber in harvest units (where feasible and practical), maintaining existing travel corridors, leaving snags in harvest units (where safety regulations allow), and trying nonstandard harvest practices where resource issues and physical limitations permit.

The Upper Carroll IDT utilized a combination of public scoping issues and resource knowledge to subdivide the Upper Carroll Project Area into a variety of important landscape zones. Definition of these landscape zones considered such aspects as the amount, distribution and fragmentation of old-growth forests, the level and distribution of previous timber harvest and roading, travel and dispersal corridors between zones that can be used by animals, the existing and potential road network for accessing timber, subsistence uses, visually sensitive areas, and important recreation areas. The landscape zones also considered the recommendations of the VPOP Committee on such aspects as small, medium, and large Habitat Conservation Areas

Summary

(HCAs). The landscape level considerations included the characteristics of the Upper Carroll Project Area itself as well as its relationship to adjacent areas such as the Naha Roadless Area, North Revilla, Orchard Lake and Creek, Misty Fiords National Monument, Swan Lake hydroelectric facility, and Shelter Cove. Consideration was given to social factors (including subsistence use, visual concerns, SSARAA Fish Hatchery, timber harvest economics, and transportation/utility corridors), and proposed land use designations in the development of landscape zones. Table Sum-1 displays the Landscape Management Zones identified by the ID Team for the Upper Carroll Project Area.

Table Sum-1
Upper Carroll Landscape Management Zones

Landscape Zone	Description
1. Large and Medium sized old-growth habitat blocks	Large and medium Habitat Conservation Areas (HCAs) as defined in the 1994 Draft Interim Habitat Management Guidelines EA. No final decision has been issued. The shape and configuration displayed represents one potential way of providing core areas of unfragmented old-growth habitat where significant populations of old-growth dependent species can be maintained.
1(A) Naha Block	This large old-growth habitat block is comprised of the Naha LUD II Roadless Area (timber harvest is not allowed) plus a portion of VCU 744 that connects to the estuary at the head of Carroll Inlet. This block is approximately 40,088 acres in size.
1(B) Traitor's Cove Block	This medium sized old-growth habitat block was originally identified as old-growth retention in the North Revilla ROD. It is located inside the Salt Chuck in Traitor's Cove. This block is approximately 5,498 acres in size.
1(C) Orchard Lake Block	This medium sized old-growth habitat block is proposed to be managed as a Semi-primitive Recreation LUD in the Draft TLMP Revision - Alternative P, which would not allow commercial timber harvest. Orchard Lake and Creek are eligible for inclusion under the National Wild and Scenic Rivers Act. The North Revilla ROD designated this block as old-growth retention for the life of the project in 1993. This block is approximately 15,087 acres in size.
1(D) Swan Lake Block	This medium sized old-growth habitat block is currently designated LUD IV Timber Emphasis. This block is located south of the Swan Lake Hydropower facility. This block is approximately 13,474 acres in size.
2. Carroll Creek Block	The west side of Carroll Creek represents a small block of unfragmented old-growth habitat located inside the project boundary. The southwest portion of this area is adjacent to the Naha Block (see 1A above).
3. Late-successional Corridors	Corridors approximately 1/4 mile wide that provide connectivity between core areas of unfragmented old-growth habitat. These corridors generally follow riparian zones or other areas of gentle topographic relief commonly utilized for migration between areas.
4. Low and Very Low Economic Zones	These zones represent areas which are only economical to harvest during market cycles with very high stumpage rates for timber or if augmentation (contributed funds) helps to offset costs.

Table Sum-1 (Continued)

Upper Carroll Landscape Management Zones

Landscape Zone	Description
	West side of Carroll Inlet - Estimated road costs to connect the Shelter Cove Road System north to the head of Carroll Inlet exceed a million dollars per mile. Virtually all of the timber within this zone has been classified as unsuitable for timber harvest due to very high mass movement potential (MMI 4 soils). There is, therefore, insufficient timber value to recover the road construction costs.
	West side of Carroll Creek and the northern 1/3 of VCU 744 - There are three pockets of timber within these zones; each requires a major bridge crossing (span in excess of 100 feet) of Carroll Creek. The cost for each bridge is estimated at approximately \$500,000. The possibility does exist of pulling one of the bridges in lower Carroll and re-using it in the northern portion of VCU 744 if offered as a separate offering/sale several years after lower Carroll is sold.
	Neets Creek VCU 737 - The head of Neets Bay is within a state land selection, with the majority of the valley bottom having been extensively harvested during the 1960s. The existing road would require major reconstruction prior to being re-used. The entire southern half of the VCU and the mid-slope portion of the northern half of the VCU have been classified as unsuitable for timber harvest due to potentially unstable slopes (MMI4). The remaining upper third of the slope is located at high elevations with low volume, difficult road construction, and long helicopter yarding distances all contributing to reduce the timber economic value of this area.
5. Riparian Habitat	Riparian areas are made up of plant communities in the vicinity of streams that are adapted to periodic inundation by water from precipitation, snowmelt, or other flood events. Riparian areas are important to the stream ecosystem because: (1) they provide shade which regulates stream temperature; (2) they provide a source of woody debris for fish habitat; (3) they help maintain the structural integrity of the streambank; and (4) litter from vegetation provides nutrients to the stream.
6. Riparian Fens	Riparian fens are an important type of wetland found in footslope or valley bottom areas adjacent to lakes and streams. Hydrologically they act like a saturated sponge, slowly transferring sub-surface water from neighboring hillslopes to the stream or lake. Because fens are not stagnant, they provide a steady supply of well-oxygenated, nutrient-rich recharge to receiving water bodies. For streams, riparian fens also act as flow regulators; they capture excess runoff during storm events, store it, and then slowly release it during drier periods. This process helps maintain low flows during droughts and, to a point, buffers the stream from excessive peakflow during storms.
7. SSARAA Fish Hatchery	Located in VCU 737 where Neets Creek enters Neets Bay - The Southern Southeast Alaska Regional Aquaculture Association (SSARAA) operates the Neets Bay Fish Hatchery under a special use permit from the Forest Service. Fresh water from Bluff Lake is used in the hatchery operation. Water quality, particularly sedimentation, is a major concern. The Neets Bay Fish Hatchery is economically significant to the local fishing industry.

Summary

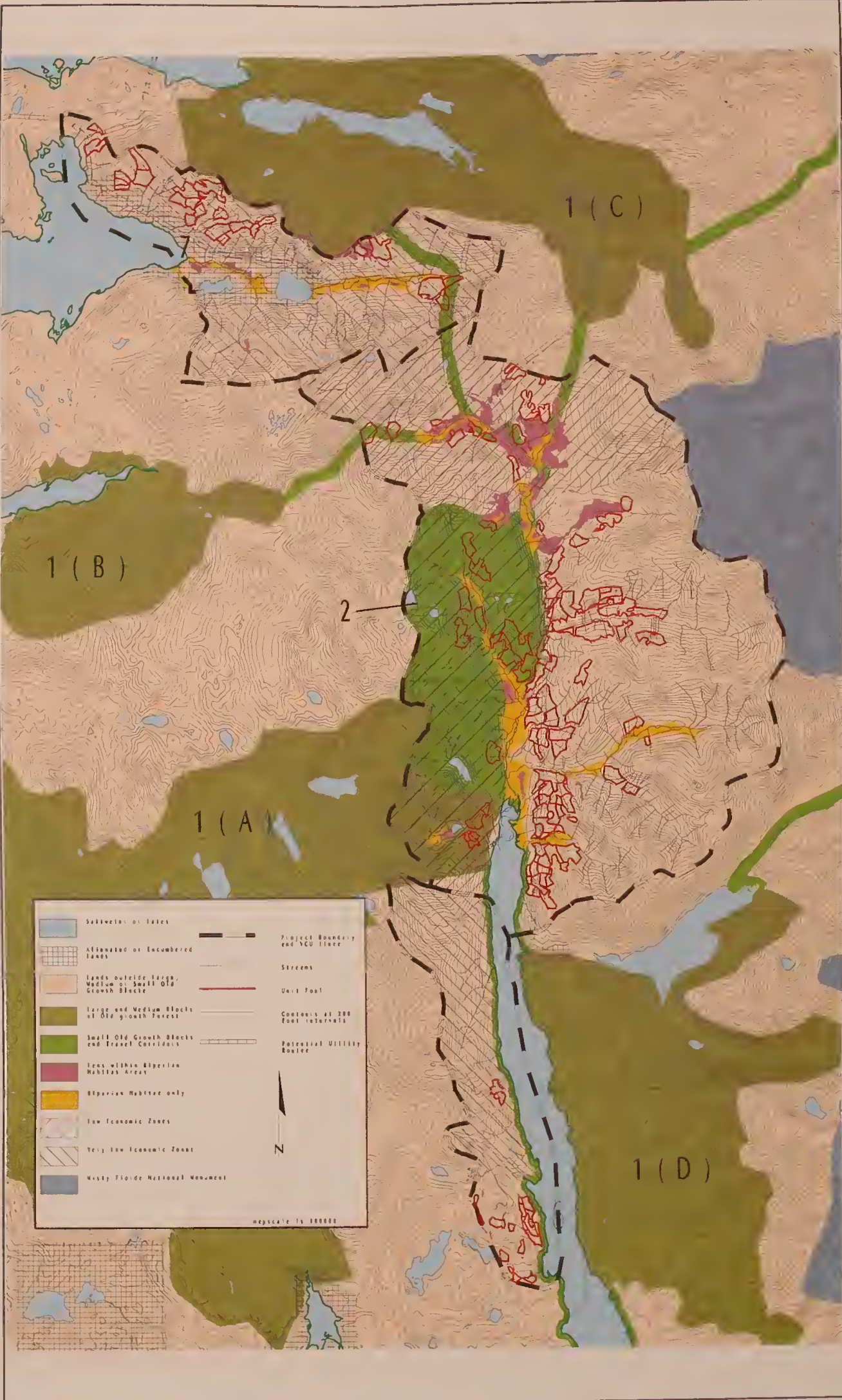
Table Sum-1 (Continued)

Upper Carroll Landscape Management Zones

Landscape Zone	Description
8. Utility Corridor	The utility corridor runs north from the Swan Lake Hydropower facility along the eastern shore to the head of Carroll Inlet, then follows Carroll Creek north to Neets Creek. At this point, one potential route proceeds northward around Orchard Lake outside the Project Area. A second route turns west down Neets Creek and would generally follow the existing and proposed road locations toward Shrimp Bay until leaving the Project Area. This corridor is identified here because the roads constructed for timber harvest could reduce the powerline construction and maintenance costs. It is also used to help address future potential effects on scenic quality and recreation.

Chapter 3 and the Appendices contain additional maps that present some of the features described above in greater detail. The landscape zones described in the previous table (Table Sum-1) are displayed by location in Figure Sum-3 on the following page.

Landscape Management Zones - Upper Carroll Area



Alternatives Eliminated from Detailed Study

A number of alternatives were examined, but not considered for detailed study in this Draft EIS. This section presents those alternatives and the rationale for not considering them further.

Alternative A

Single Resource or Issue—Alternatives that focused upon one resource or issue were eliminated from consideration as implementable alternatives. While alternatives constructed around a single resource may not be implementable, the issue itself may still be significant. Each alternative will be evaluated against all the significant issues.

Alternative B

Transportation/Utility Corridor between Ketchikan and the Project Area—The proposed road link and utility corridor are separate projects and independent from this EIS. The road link project is not reasonably foreseeable. Ketchikan Public Utilities has awarded a contract to Foster Wheeler Environmental Corporation to complete an EIS for the proposed electrical intertie (including associated roads, if any) from Swan Lake to Lake Tyee. The preliminary preferred powerline route includes approximately 30 to 40 miles within the Upper Carroll Project Area. The two proposed actions appear to be connected because of the potential road locations and opportunity for cooperative agreements. The similar time lines could make the issue ripe for a decision as well. Alternative 2, looks at how much timber and associated roads could be built and still meet Forest Plan standards and guidelines. The question as to how much of the transportation/utility corridor could be built is addressed for each alternative, with Alternative 2 serving as the upper level benchmark. A separate alternative, which maximizes road construction for the transportation/utility corridor is, therefore, unnecessary.

Alternative C

Avoid Previously Mapped Old-growth Retention Areas—Several commenters asked the Forest Service to analyze an alternative that would keep intact all previously mapped old-growth retention during this entry. Under the TLMP Draft Revision standards and guidelines, old-growth habitat will remain unaltered in beach, estuary, and TTRA buffers, research natural areas, LUD I and LUD II areas, as well as in unsuitable commercial forest land. Previously mapped old-growth retention areas are consequently considered as part of the tentatively suitable and available timber base, unless otherwise excluded. Approximately 5,147 acres of retention were established as part of previous project level EISs.

The IDT examined the possibility of constructing an alternative which avoided all previously mapped old-growth retention areas. Due to the location and disjointed smaller patch size, it was impossible to construct an economically viable alternative which completely avoided existing retention with all roads and units. Many of the retention blocks were located at higher elevations, in low volume stands, were small and narrow, and did not logically connect to other high value areas. Current conservation biology theory places greater emphasis on larger blocks of old-growth which have logical connections for wildlife movement. This alternative was, therefore, not considered in detail. The effects of the alternatives on previously mapped old-growth areas are considered in Chapter 3.

Alternative D

Public Comment Alternative—Several commenters asked the Forest Service to eliminate specific areas or individual units that were of concern to them. For example, the Southern Southeast Alaska Regional Aquaculture Association (SSARAA) operates the Neets Bay Fish Hatchery under special use permit from the Forest Service. A number of comments received indicated that the proposed harvest in Neets Bay would pose a sedimentation risk to the fish hatchery operation. A citizen's alternative recommended dropping the Neets Bay harvest units and making up the volume from the Orchard Lake area.

Summary

Harvesting in the Orchard Lake area was not considered because: (1) it is a recommended semi-primitive recreation area under TLMP Revision Supplement Draft EIS, Alternative P; (2) Orchard Lake and Creek have been determined to be eligible for possible inclusion in the National Wild and Scenic Rivers System; and (3) it is outside the Project Area boundary.

Concern about sedimentation from timber harvest and associated roads was addressed in various ways. Alternatives 3 and 4 do not propose any harvest in the Neets Creek watershed, while Alternatives 2 and 5 propose distinctly different levels of harvest and road construction within the watershed. A watershed analysis which looks at sedimentation risk was conducted for both the Neets Creek and Carroll Creek drainages (see Chapter 3). Forest Service standards and guidelines, as well as BMPs to protect soil and water quality, apply to all alternatives.

Alternative E

Helicopter Logging Alternative—Public comments expressed a concern for the effects of road and LTF construction on the marine environment as well as the Carroll Creek estuary, water quality, fisheries, and subsistence values. The IDT constructed an alternative which would cable log the Shelter Cove (VCU 746) portion of the Project Area while helicopter logging units within 1.5 miles of Carroll Inlet.

This alternative resulted in the harvest of 419 acres or 15.3 MMBF. The mid-market analysis indicated a net stumpage value of negative \$-209.73 per MBF. Current market prices yielded a stumpage value of negative \$-51.70 per MBF.

This alternative was not considered for detailed study because it does not appear to be economically viable at either current- or mid-market values, and provides significantly less volume than listed in the purpose and need.

Alternatives Considered for Detailed Study

Five alternatives for making timber available to local timber purchasers from the Upper Carroll Project Area were considered in detail. Each alternative is consistent with the TLMP (1979a, as amended) and Alternative P of the TLMP Draft Revision (1991a). For each alternative this section provides a discussion of: (1) the emphasis or intent of the alternative; (2) various resource outputs associated with implementation; and (3) environmental consequences. Alternatives are compared in detail later in this chapter and summarized in Table S-2.

Alternative 1

Emphasis—The emphasis of this alternative is to propose no new timber harvest from the Upper Carroll Project Area at this time. It does not preclude timber harvest from other areas at this time, or from the Upper Carroll Project Area at some time in the future. The Council of Environmental Quality (CEQ) regulations 40 CFR 1502.14d requires a "No Action" alternative be analyzed in every EIS to serve as a benchmark by which effects of the other action alternatives are to be measured. The Existing Condition map shows the distribution of vegetation associated with no new timber harvest.

Outputs—There are no new timber harvest outputs associated with this alternative. Visual quality, wildlife habitat quality, semi-primitive recreation opportunities, as well as other resource values would remain at their current condition.

Alternative 2

Emphasis—The emphasis of this alternative is to accelerate progress toward the desired future condition for timber management while meeting Forest Plan Standards and Guidelines for other resources. Timber volume made available to local timber purchasers is maximized this entry under this alternative. This alternative is designed to evaluate the effects of harvesting as much of the Project Area as possible in a combination that still meets standards and guidelines. This alternative serves as an upper level benchmark that can be used to project the cumulative affects of the reasonably foreseeable future activities (see Appendix A) within the Project Area. Another feature of this alternative is that it looks at the maximum amount of road that could be constructed as part of a commercial timber sale that could be used to facilitate the development of a potential transportation/utility intertie within the project area.

Outputs—Implementation of this alternative would schedule the harvest of 2,498 acres, in 85 harvest units for approximately 72 MMBF of sawlog and utility volume, indicating an average unit size of 29.4 acres. Of this harvest, 19 units totaling 424 acres are planned for partial cut; the remainder are planned for clearcut harvest. To implement this level of harvest, 58 miles of new road would be constructed, and 7 miles of existing road would require reconstruction. Road construction clearing will yield an additional 5 MMBF of right-of-way (ROW) volume. This indicates an average of 1.3 MMBF per mile of new road construction and a total of 1.2 MMBF per mile of road. It schedules 424 acres or 12.5 MMBF of volume for helicopter yarding. Preliminary analysis indicates a net mid-market stumpage value of \$-87.54 per MBF. This alternative would result in approximately 24.7 miles of road located within a proposed transportation corridor or 23.8 miles within a utility corridor that could facilitate its future construction and/or maintenance.

The development of one new Log Transfer Facility (LTF) and two existing LTFs will be required to implement this alternative. Floating or land based logging camps are anticipated with the Shelter Cove, Carroll Inlet and Shrimp Bay LTFs. The Alternative 2 map provides the spatial relationship among roads, units and other geographic features of the Upper Carroll Project Area.

Alternative 3

Emphasis—The objective of this alternative is to emphasize timber economics and conventional cable yarding methods. The location of harvest units, selection of silvicultural prescriptions, logging systems, and a transportation network is primarily based on maximizing the mid-market value. This entry proposes only limited helicopter timber harvest. This approach emphasizes a positive net economic return for the proposed harvest units, by avoiding the low and very low economic zones. Due to the juxtaposition of the landscape management zones within the project area, this alternative minimizes impacts to old-growth habitat blocks, late-successional corridors, riparian habitat, fens, and the SSARAA Fish Hatchery in Neets Bay to the greatest extent of all the alternatives. Development of the transportation/utility corridor could be minimized as a consequence of harvesting the least amount of timber and constructing the fewest miles of road.

Outputs—Alternative 3 schedules the harvest of 42 individual harvest units, totaling 36 MMBF of sawlog and utility volume from 1,192 acres, indicating an average unit size of 28.4 acres. Of this harvest, 5 units totaling 29 acres are planned for partial cut; the remainder are planned for clearcut harvest. This alternative requires the construction of 24 miles of new specified roads plus 2 miles of reconstruction. Road construction clearing will yield an additional 1 MMBF of right-of-way (ROW) volume. This indicates an average of 1.5 MMBF per mile of new road construction and a total of 1.4 MMBF per mile of specified road. It schedules 29 acres or 1 MMBF of volume for helicopter yarding. Preliminary analysis indicates a net mid-market stumpage value of \$+18.61 per MBF. This alternative would result in approximately 6.0 miles of

Summary

road located within a proposed transportation corridor or 6.4 miles within a utility corridor that could facilitate its future construction and/or maintenance.

The development of one new Log Transfer Facility (LTF) and one existing LTF will be required to implement this alternative. Floating or land based logging camps are anticipated with the Shelter Cove and Carroll Inlet LTFs. The Alternative 3 map provides the spatial relationship among roads, units, and other geographic features of the Upper Carroll Project Area.

Alternative 4

Emphasis—The emphasis of this alternative is to meet the stated purpose and need while avoiding harvest on the west side of Carroll Creek and in the Neets Creek drainage (VCU 737). The west side of Carroll Creek contains the largest block of high value wildlife habitat in the project area and deferral would avoid any fragmentation this entry. Deferral of the Neets Creek drainage would avoid any potential increase in sedimentation from timber harvest and road construction activities that might negatively affect the SSARAA fish hatchery operation in Neets Bay. Individual unit selection attempted to avoid high volume timber stands and wildlife travel corridors, with timber sale economics being de-emphasized. This alternative differs from Alternative 3 in that more volume is harvested and different units were selected for harvest as a result of less emphasis on timber sale economics.

Outputs—Alternative 4 schedules the harvest of 55 individual harvest units, totaling 42 MMBF of sawlog plus utility volume from 1,562 acres, indicating an average unit size of 28.4 acres. Of this harvest, 9 units totaling 112 acres are planned for partial cut; the remainder are planned for clearcut harvest. This alternative requires the construction of 34 miles of new specified roads plus 2 miles of reconstruction. Road construction clearing will yield an additional 4 MMBF of right-of-way (ROW) volume. This indicates an average of 1.4 MMBF per mile of new road construction and a total of 1.3 MMBF per mile of specified road. It schedules 112 acres or 13 MMBF of volume for helicopter yarding. Preliminary analysis indicates a net mid-market stumpage value of \$-10.97 per MBF. This alternative would result in approximately 9.4 miles of road located within a proposed transportation corridor or 10.2 miles with a utility corridor that could facilitate its future construction and/or maintenance.

The development of one new Log Transfer Facility (LTF) and one existing LTF will be required to implement this alternative. Floating or land based logging camps are anticipated with the Shelter Cove and Carroll Inlet LTFs.

Alternative 5

Emphasis—The emphasis of this alternative is to meet the stated purpose while striking a balance between timber sale economics and other resource values. This alternative makes a minor entry into the Neets Creek drainage approximately six miles upstream from the SSARAA fish hatchery. A road tie from the LTF in Carroll Inlet to the existing road in Neets Creek would occur under this alternative, but the Neets Creek road itself would not be reconstructed at this time (roadbed is overgrown with alder and requires realignment in places). Timber harvest would occur in the small old-growth block located on the west side of Carroll Creek.

Outputs—Alternative 5 schedules the harvest of 63 individual harvest units, totaling 57 MMBF of sawlog plus utility volume from 1,982 acres, indicating an average unit size of 31.5 acres. Of this harvest, 10 units and 179 acres are planned for partial cut; the remainder are planned for clearcut harvest. This alternative requires the construction of 45 miles of new specified roads plus 2 miles of reconstruction. Road construction clearing will yield an additional 9 MMBF of right-of-way (ROW) volume. This indicates an average of 1.5 MMBF per mile of new road

construction and a total of 1.4 MMBF per mile of road. It schedules 179 acres or 5.7 MMBF of volume for helicopter yarding. Preliminary analysis indicates a net mid-market stumpage value of \$+2.85 per MBF. This alternative would result in approximately 13.8 miles of road located within a proposed transportation corridor or 14.4 miles within a utility corridor that could facilitate its future construction and/or maintenance.

The development of one new Log Transfer Facilities (LTF) and one existing LTF will be required to implement this alternative. Floating or land based logging camps are anticipated with the Shelter Cove and Carroll Inlet LTFs. The Alternative 5 map provides the spatial relationship among roads, units, and other geographic features of the Upper Carroll Project Area.

Using an evaluative process that compares the benefits and adverse effects of each alternative against the issues, the USDA Forest Service has identified Alternative 5 as the preferred alternative for this EIS. The identified Preferred Alternative will be examined before preparation of a Final EIS, taking into consideration public comments received, as well as additional information and analysis.

Table Sum-2 provides a summary of outputs and environmental consequences by which the alternatives may be compared.

Preferred Alternative

Summary Comparison

Summary

Table Sum-2

Summary Comparison of Alternatives

Activity/Resource	Units	Alternatives				
		1	2	3	4	5
Timber						
Units	Number	0	85	42	55	63
Estimated harvest unit volume	MMBF	0	72	36	42	57
Estimated right-of-way (ROW) volume	MMBF	0	5	1	4	9
Partial cut (shelterwood)	Acres	0	424	29	112	179
Clearcut harvest	Acres	0	2,073	1,163	1,450	1,803
Total harvest	Acres	0	2,497	1,192	1,562	1,982
Units over 100 acres	Number	0	1	2	2	2
Shovel harvest	MMBF	0	1.8	1.1	1.1	1.9
Running Skyline	MMBF	0	51.3	31.8	36.6	44.1
Live Skyline (Shotgun)	MMBF	0	4.2	1.0	0.4	2.6
Slackline harvest	MMBF	0	1.9	1.0	2.0	2.7
Helicopter harvest	MMBF	0	12.5	1.0	2.7	5.7
Estimated stumpage (mid-market rates)	\$ / MBF	\$0	(\$87.54)	\$+18.61	(\$10.97)	\$+2.85
Estimated stumpage (current rates)	\$ / MBF	\$0	\$+73.53	\$+176.28	\$+150.16	\$+162.51
Receipts to State of Alaska	\$M	\$0	\$3,156	\$2,119	\$2,572	\$3,560
Avg. annual jobs over 4 years	# of jobs	0	116	57	67	91
Proportionality Remaining (K32 - TTRA Base 8.82%)	Percent	8.9	8.88	8.76	8.86	8.77
Proportionality Remaining (K35 - TTRA Base 5.39%)	Percent	5.44	5.46	5.46	5.46	5.45
Roads & Transportation						
Specified road construction	Miles	0	58	24	34	45
Road reconstruction	Miles	0	7	2	2	2
Temporary road construction	Miles	0	21	11	14	16
New Log Transfer Facilities	Each	0	1	1	1	1
Reconstruction/Use of existing Log Transfer Facilities	Each	0	2	1	1	1
Roads crossing Class I or II streams	Number	0	43	17	23	43
Transportation/Utility Corridor						
Transportation Corridor (32-45 miles)	Miles	0	24.7	6.0	9.4	13.8
Utility Corridor (25 miles)	Miles	0	23.8	6.4	10.2	14.4
Road Connection from Shelter Cove to Carroll Creek	Response	No	No	No	No	No
Road Connection from Carroll Creek to Neets Creek Road	Response	No	Yes	No	No	Yes
Road Connection from Carroll Creek to Shrimp Bay	Response	No	Yes	No	No	No

Table Sum-2 (continued)

Summary Comparison of Alternatives

Activity/Resource	Units	Alternatives				
		1	2	3	4	5
Biodiversity						
Unfragmented old-growth patches remaining						
1,000 Acres and larger	Acres	11,735	10,175	10,874	10,877	10,522
500-1,000 Acres	Acres	2,270	2,035	2,152	2,085	2,021
100-500 Acres	Acres	2,243	2,090	2,189	2,144	2,194
Naha old growth habitat - large block	Acres harvested	0	49	0	0	0
Carroll River old growth habitat - small block	Acres harvested	0	370	0	0	394
Corridors connecting old growth blocks (2,737 acres)	Acres harvested	0	93	34	22	157
Old growth acres remaining in Project Area	Acres	17,641	15,661	16,654	16,467	16,098
Percent of original old-growth remaining	Percent	81	72	77	76	74
Wildlife - Project Area						
1997 MIS - deer	Habitat capability	389	373	375	381	375
1997 MIS - bear	Habitat capability	70	69	69	69	69
1997 MIS - marten	Habitat capability	44	41	42	42	41
1997 MIS - river otter	Habitat capability	17	16	16	16	16
1997 MIS - hairy woodpecker	Habitat capability	341	397	314	316	306
1997 MIS - Vancouver Canada goose	Habitat capability	74	64	68	67	66
1997 MIS - bald eagle	Habitat capability	40	40	40	40	40
1997 MIS - brown creeper	Habitat capability	497	438	455	465	448
1997 MIS - red squirrel	Habitat capability	22,714	21,398	21,974	21,934	21,646
1997 MIS - gray wolf	Habitat capability	1.5	1.5	1.5	1.5	1.5
Subsistence - WAAs 406 and 510						
High & Moderate use subsistence (TRUCS)	Acres harvested	0	0	0	0	0
Deer Habitat Capability	Habitat capability	3,508	3,492	3,493	3,499	3,493
Deer Population Needed to Support Current Harvest	Habitat capability	1,040	1,040	1,040	1,040	1,040
Significant Possibility of a Significant Restriction						
Deer	Response	No	No	No	No	No
Bear	Response	No	No	No	No	No
Furbearers	Response	May	May	May	May	May
Salmon	Response	No	No	No	No	No
Other Finfish	Response	No	No	No	No	No
Waterfowl	Response	No	No	No	No	No
Marine Mammals	Response	No	No	No	No	No
Indirect & Cumulative Effects of Implementing the Forest Plan over the entire rotation	Response	May	May	May	May	May

Summary

Table Sum-2 (continued)

Summary Comparison of Alternatives

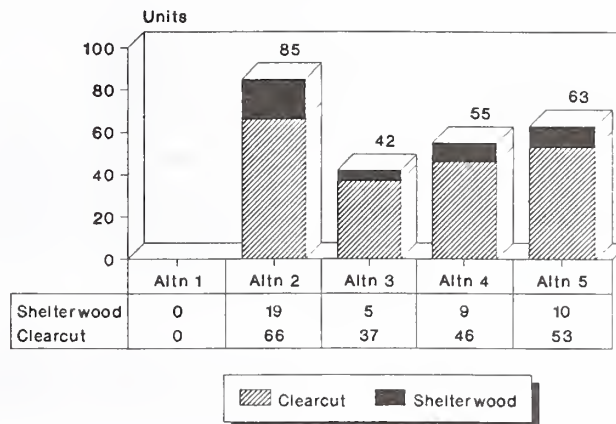
Activity/Resource	Units	Alternatives				
		1	2	3	4	5
Cultural Resources						
Impacts to known cultural resources	Each	0	0	0	0	0
Watershed & Fisheries						
Fens (watershed assessment—RHCAs) 1,192	Acres harvested	0	20	0	4	18
Riparian habitat (watershed assessment—RHCAs) 1,912	Acres harvested	0	3	3	3	3
Neets Creek Watershed (contains SSARAA Fish Hatchery)						
Acres of harvest	Acres	0	452	0	0	71
Miles of road construction & reconstruction	Miles	0	17	0	0	2
Harvest unit acres with high potential for sediment delivery to Neets Creek	Acres	0	7	0	0	0
Road miles with high potential for sediment delivery to Neets Creek	Miles	0	2.7	0	0	0
Carroll River Watershed						
Acres of harvest	Acres	0	1,887	1,045	1,379	1,812
Miles of road construction & reconstruction	Miles	0	47	25	35	45
Harvest unit acres with high potential for sediment delivery to Class I streams	Acres	0	309	71	126	326
Road miles with high potential for sediment delivery to Class I streams	Miles	0	6.5	3.1	3.8	6.3
Soils						
Very high mass movement	Acres harvested	0	65	0	39	65
High mass movement	Acres harvested	0	1,280	519	686	983
Medium mass movement	Acres harvested	0	507	435	441	431
Low mass movement	Acres harvested	0	645	215	395	503
Wetlands harvested/roaded	Acres	0	1,361	254	691	1,114
Total Karstlands in each Alternative	Acres	0	0	0	0	0
Visual Quality						
Percent increase in Cumulative Visual Disturbance						
Carroll Inlet at Shelter Cove - VCU 746	Percent	0	2	1	2	1
Carroll Estuary - VCU 744	Percent	0	10	5	6	8
Head of Neets Bay - VCU 737	Percent	0	8	0	0	0
Roadless Areas						
Change in ROS class from SPNM to RM	Percent	0	27	10	16	24
Roadless areas	Acres (M)	34,415	23,074	30,857	27,708	24,651
Recreation places with some harvest	Number	0	3	1	1	1

Comparison of Alternatives by Proposed Activity

The action alternatives propose the harvest of from 42 to 85 individual units. Alternative 2 proposes the most units for partial cutting (19), while Alternative 3 proposes only 5 units for partial cutting. Figure S-4 shows the number of units proposed for harvest under each alternative by silvicultural system.

Figure Sum-4

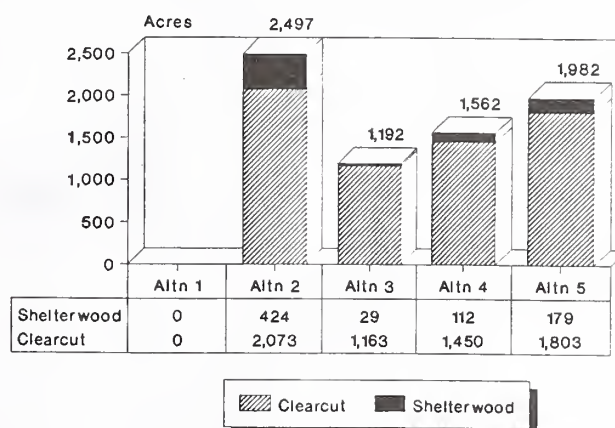
Number of Units Proposed for Harvest by Silvicultural System



Alternative 2 proposes the highest level of harvest with approximately 2,497 acres of timber harvest. Of the action alternatives, Alternative 3 proposes the lowest level of harvest with 1,192. Figure Sum-5 shows the number of acres proposed for harvest for each alternative by silvicultural system.

Figure Sum-5

Total Acres Proposed for Harvest by Silvicultural System



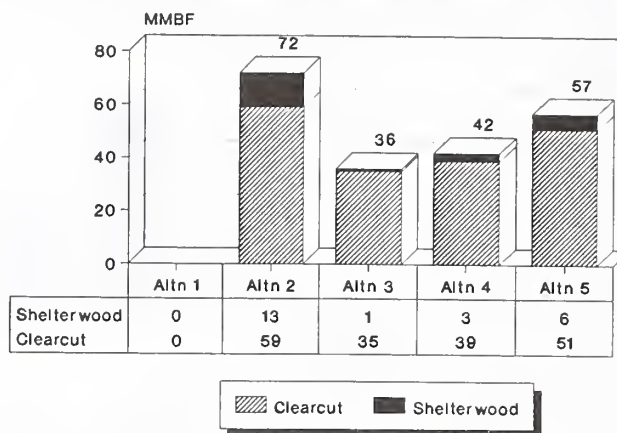
Excluding right-of-way (ROW) volume each action alternative, except Alternative 2, generated less volume than the identified purpose and need of 70 MMBF. Alternative 3 comes within 48

Summary

percent at 36 MMBF and Alternative 2 slightly exceeds with 72 MMBF. Figure Sum-6 shows the volume of timber proposed for harvest for each alternative by silvicultural system.

Figure Sum-6

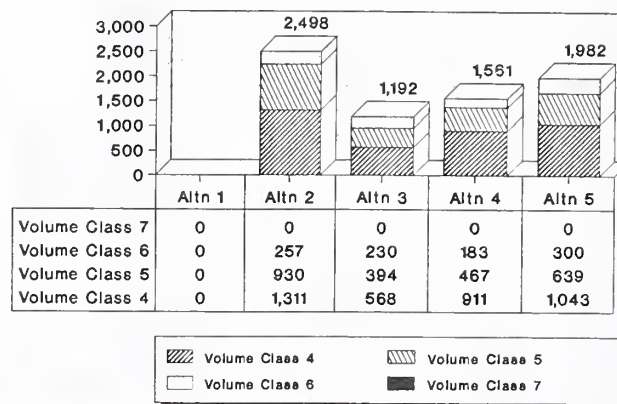
Total Volume Proposed for Harvest



Commercial forest land (CFL) is divided into Volume Class Strata according to the Ketchikan Area's timber type map. This volume class information is used in calculating volume harvested and economic analysis. Figure Sum-7 shows volume class strata breakdown for each alternative. Inclusions of stands typed as non-commercial forest that were field verified to be merchantable were aggregated into the volume class 4 acres.

Figure Sum-7

Proposed Harvest by Volume Class Strata



Summary

The Tongass Timber Reform Act of 1990 modified the long-term contracts to:

Eliminate the practice of harvesting a disproportionate amount of old-growth timber by limiting the volume harvested over the rotation in Volume Classes 6 and 7, as defined in TLMP and supporting documents. The proportion of volume harvested in these classes within a contiguous Management Area does not exceed the proportion of volume currently represented by these classes within the Management Area.

The Project Area is primarily located within Management Area K32 and contained 8.82 percent proportion of volume class 6 and 7 timber as of November 1990 (Date TTRA became law). The current proportionality is 8.86 percent. Alternatives 2 and 4 would result in a proportionality in excess of 8.82 percent, while Alternatives 3 and 5 would dip slightly under the base proportion.

A small portion of Management Area K35 (VCU 746) is located within the Project Area. The TTRA baseline proportion is 5.39 percent and the current proportionality is 5.44 percent. All of the action alternatives will slightly increase proportionalities over the existing condition.

Table Sum-3

Proportion of Volume Classes 6 and 7 Proposed for Harvest by Management Area

	Total Timber Base (acres)	Volume Class 6 & 7 (acres)	Proportionality (percent)	Difference (percent) ^{1/}
Management Area K32				
TTRA Baseline				
(on November 28, 1990)	83,049	7,328	8.82	
Post TTRA Harvest	76,187	6,812	8.94	+0.12
Alternative 1	76,187	6,812	8.94	+0.12
Alternative 2	73,831	6,555	8.88	+0.06
Alternative 3	75,131	6,582	8.76	-0.06
Alternative 4	74,798	6,629	8.86	+0.04
Alternative 5	74,288	6,512	8.77	-0.05
Management Area K35				
TTRA Baseline				
(on November 28, 1990)	47,314	2,552	5.39	
Post TTRA Harvest	45,108	2,454	5.44	+0.05
Alternative 1	45,108	2,454	5.44	+0.05
Alternative 2	44,966	2,454	5.46	+0.07
Alternative 3	44,972	2,454	5.46	+0.07
Alternative 4	44,935	2,454	5.46	+0.07
Alternative 5	45,024	2,454	5.47	+0.08

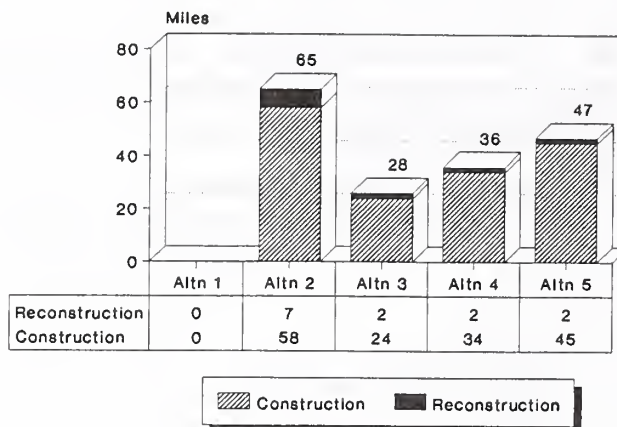
SOURCE: Nightingale, 1995

^{1/} A positive difference indicates that the percent of Volume Classes 6 and 7 remaining in the Management Area is higher than the TTRA baseline. A negative difference indicates a lower percentage than the TTRA baseline.

Summary

Road development is divided into two main categories—construction and reconstruction. Figure Sum-8 shows the number of miles of new road construction and reconstruction proposed to access the harvest units for each alternative.

Figure Sum-8
Proposed New Road Construction & Reconstruction



There are two existing LTFs and one new LTF required to implement the various alternatives. Alternative 2 would utilize all three LTFs (Shrimp Bay, Shelter Cove and Carroll Inlet) while the other action alternatives would not require the use of the Shrimp Bay LTF. This analysis has roughly estimated which units or groups of harvest units would most economically be hauled to a given LTF. Actual haul may be different. Table Sum-4 shows the volume of harvest projected to be hauled to each LTF.

Table Sum-4
Proposed Harvest, by Existing & New Log Transfer Facility, in MMBF

	Alt.1	Alt.2	Alt.3	Alt.4	Alt.5
Shrimp Bay	0	15	0	0	0
Shelter Cove	0	4	4	4	2
Carroll Inlet*	0	54	32	38	55

SOURCE: Oien, 1995

* New Log Transfer Facilities

Comparison of Alternatives by Significant Issue

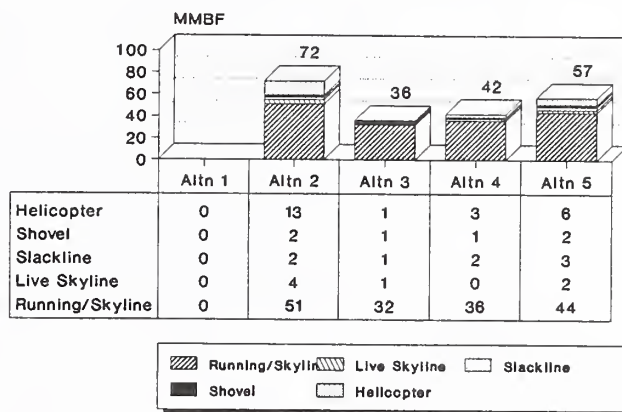
Chapter One presents in detail the significant issues that are the focus of this EIS and the key indicators for evaluating the impacts of timber harvest on each issue. This section compares the alternatives in terms of these issues. The baseline for comparing alternatives is Alternative 1, the no-action alternative. Chapter Three contains the detailed evaluation of the potential effects of timber harvest and road construction activities under each alternative on forest resources.

Issue 1. Timber Harvest Economics

Logging Systems

Estimated timber economics focuses on the residual value (stumpage) of the timber after all associated logging and transportation costs are subtracted. Generally, the most expensive logging method is helicopter, followed by slackline, highlead, live skyline (shotgun), running skyline and shovel yarding. Average yarding distance, uphill versus downhill yarding, volume per acre, species composition and value, in combination with other factors, will influence the relative cost of each yarding method. Helicopter yarding is necessary in areas where it is impractical to build road or where aerial logging is necessary to meet specific standards and guidelines. Alternative 2 proposes the most helicopter volume (13 MMBF), while Alternative 3 proposes very little (1 MMBF). Figure Sum-9 compares the logging systems proposed for each alternative.

Figure Sum-9
Timber Harvest by Logging System



Mid-market Value

The analysis of timber values in the Timber section of Chapter Three looked at both the mid-market and current-market values for each alternative. The current-market values are considerably higher than the average or mid-market values which indicate that: (1) consumer demand is higher; (2) timber supplies are limited; or (3) some combination of the above is true. All of the alternatives show a positive net stumpage at current-market values, while only Alternatives 3 and 5 are positive at mid-market value.

Summary

Table Sum-5 compares the economics of timber harvest in dollars/thousand board feet (\$/MBF) for each alternative under mid-market conditions (generally representing the average market condition and product mix) and current-market conditions. The conversion rate expresses the net dollar value of the timber volume after subtracting the production costs from the log values.

Table Sum-5
Estimated Mid-market and Current-market Stumpage Value

Components	Alternatives				
	1	2	3	4	5
Mid-Market					
Conversion Rate (\$/MBF)	0	-87.54	+18.61	-10.97	+2.85
Current-Market					
Conversion Rate (\$/MBF)	0	+73.53	+176.28	+150.16	+162.51

SOURCE: Marks, 1995

Issue 2. Fish Habitat and Water Quality

Best Management Practices

There is no measurable effect on water quality or fisheries production by any of the timber harvest or associated activities proposed by any of the action alternatives. All alternatives meet the requirements and intent of the Clean Water Act. Implementation of the TTRAs requirement to provide a minimum 100-foot buffer on Class I streams and Class II streams flowing directly into Class I streams would effectively mitigate direct stream channel impacts from proposed timber harvest and road construction. Adherence to BMPs outlined in the Soil and Water Conservation Handbook (USDA FSH 2509.22) during the design of units and roads will minimize the potential direct effects to fish as well. Site-specific BMPs were developed and selected to minimize the potential for impact to fish habitat. These site-specific BMPs are noted on the individual Harvest Unit and Road Design cards in Appendix K.

Habitat Capability

Fish habitat capability models are used to estimate the effects of timber harvest on the capability of streams to provide habitat for selected species of salmon and trout. Because there are many factors which influence fish populations—including commercial/sport harvest, oceanic conditions, and predation—these computer models provide only relative measures of habitat capability. These models indicate that there is no change in habitat capabilities for coho and pink salmon, or for Dolly Varden char and the species which they represent, among the alternatives including the no-action alternative.

TLMP Draft Revision, Alternative P

Every major watershed (VCU) within the Project Area has experienced prior harvest and road construction. Reentering these drainages may generate a greater potential risk for impacts on water quality, with the risk expected to be greater in those watersheds with the higher cumulative percents of harvest. The standards and guidelines associated with Alternative P of the TLMP Revision Supplement to the Draft EIS (TLMP Draft Revision 1991a) limit the amount of timber harvest within a given watershed to 35 percent of the total land base within a 15-year period. Table Sum-6 shows the existing direct and indirect effects of timber harvest and road construction by third order or larger watershed.

Table Sum-6

Cumulative Watershed Effects, Percentage of Watershed Harvested and Roaded in Third Order or Larger Watersheds

Watershed Number	Watershed Harvested and Roaded 1982-1997				
	Alt.1	Alt.2	Alt.3	Alt.4	Alt.5
C41B	0	3	0	0	0
C43A	0	28	0	0	0
C58A	7	3	0	0	0
D69B	0	3	0	2	4
D70C	0	8	5	6	9
D71A	0	5	10	6	9
D74A	0	0	0	0	0
D79A	0	12	14	14	10
D80B	0	0	0	0	0

SOURCE: Babik, 1995

Stream Crossings

Another measure of potential risk to fish habitat from timber harvest is the associated new road construction and road reconstruction which crosses streamcourses (see Chapter Three-Fisheries). During placement of culverts or bridges, sediment may be introduced into the streams which may have short- or long-term effects on water quality. Alternative 3 proposes the fewest stream crossings, while Alternative 2 proposes the most. This is shown in Table Sum-7.

Table Sum-7

Stream Crossings to be Constructed

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Class I	0	19	7	8	14
Class II	0	24	10	15	29
Class III	0	112	67	77	80
Total Crossings	0	155	84	100	123

SOURCE: Oien, 1995

Mass Movement Index (MMI)

Following timber harvest, there is an increased risk of landslides until second growth and the brush layer become firmly established. One way of analyzing this risk is to determine the amount of timber harvest on slopes which have high mass movement index (MMI) soils. This rating does not imply that such a mass-wasting event will occur; rather, it ranks the alternatives on the basis of the potential for a mass-wasting event to occur, which may or may not result in an increase in stream sediment. This increased stream sedimentation may result in some loss or impairment of resident and anadromous fish spawning and rearing habitat. Table Sum-8 displays the proposed harvest on high MMI (MMI = 3) and very high MMI (MMI = 4) soils by alternative. Virtually all very high MMI soils have been removed from the base. Only those sites that appear to be small inclusions or mistyped have been retained in the unit pool. These sites have been examined by a professional soil scientist as part of unit reconnaissance.

Table Sum-8

Acres of High Hazard Soils Harvested by Alternative

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
High MMI soils	0	1,280	519	686	983
Very High MMI soils*	0	65	0	39	65

SOURCE: Babik, 1995

* See Chapter 3-Soils for details of MMI classifications.

Sediment Transfer and Deposition

The Carroll Creek and Neets Creek watersheds were evaluated for sediment delivery and depositional potential using a watershed-level analysis (Geier and Loggy, 1995). The watersheds were divided into sub-basins and reaches. Sediment transport and deposition indices were developed based upon watershed morphology, discharge, and potential sediment sources (for a

detailed description of this process see Appendix F, Sediment Transfer and Deposition Analysis Procedure). This sediment transfer index indicates where in a watershed sediment production and deposition is a potential problem for maintenance of aquatic habitat. The quantity of sediment transported and deposited depends upon a number of factors, including nature of sediment source, stream discharge, and channel morphology. These are factors that resource managers must consider when they undertake activities on areas that are linked to important aquatic habitat.

Results of this sediment transport and deposition risk assessment for roads and units in the Upper Carroll action alternatives indicate that Alternative 3 and 4 have a relatively low overall risk of sediment delivery to streams. By minimizing harvest unit location and road construction near streamcourses in high risk sub-basins and proposing no activities in Neets Creek watershed, Alternative 3 presents the lowest overall risk of sediment production and delivery to sensitive stream reaches. Alternative 5 presents a higher risk of producing sediment that may affect beneficial uses, mainly by proposing road construction and timber harvest in the west fork of Carroll Creek. Alternative 2 poses the highest risk of sediment delivery from road related sediment. It also proposes a number of timber harvest units in the west fork of Carroll Creek and within the Neets Creek watershed.

Scenic Quality

There are 3 key viewsheds within the Project Area. The proposed visual quality objectives (VQOs) for this project establish the minimum visual quality management standards for these key viewsheds.

Table Sum-9 displays the proposed VQOs for each key viewshed and the percent change in visual cumulative disturbance level by alternative. Alternative 1 represents the existing visual condition. In all viewsheds for all alternatives, the proposed harvest units achieve the proposed visual quality objectives.

Table Sum-9
Proposed VQOs and Changes in Cumulative Visual Disturbance

Viewshed	Proposed VQO*	Changes in Percent Visual Condition*				
		Alt.1**	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Carroll/Shelter Cove	PR-M	0	2	1	2	1
Carroll Estuary	PR-M	0	10	5	6	8
Head of Neets Bay	PR-M	0	8	0	0	0

SOURCE: Angelus, 1995

* R = Retention; PR = Partial Retention; M = Modification; MM = Maximum Modification

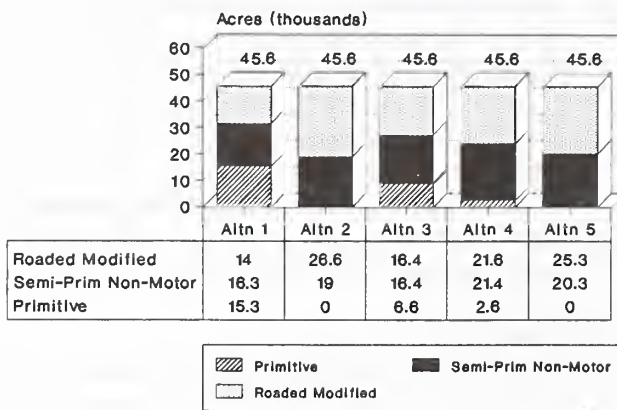
** Alternative 1 represents the existing condition

Summary

Recreation Opportunity Spectrum (ROS)

Implementing any of the action alternatives will change the existing Recreation Opportunity Spectrum (ROS) class within the Project Area. Figure Sum-10 shows the change in ROS class by alternative.

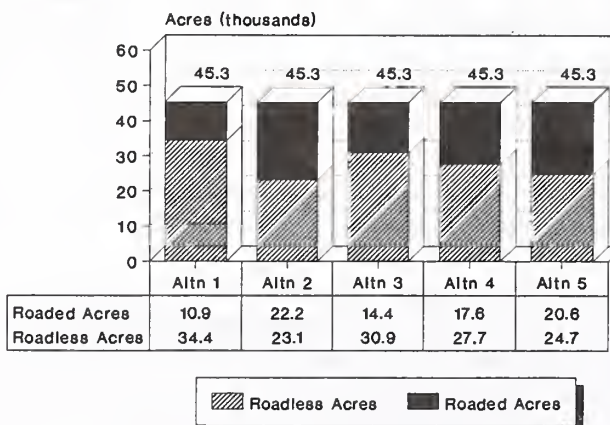
Figure Sum-10
Changes in ROS Class by Alternative



Roadless Areas

The TLMP Draft Revision (1991a) identified two roadless areas which lie within or partially within the Project Area. The impact of timber harvesting on roadless areas is much larger than the acres harvested because the sights and sounds associated with the harvest activity affect the surrounding area. Roadless areas generally need to be at least 5,000 acres in size to be considered roadless. Figure Sum-11 shows the number of roadless area acres that will remain after implementation of an alternative.

Figure Sum-11
Timber Harvest within Roadless Areas



Issue 4. Wildlife Habitat

The major effect on wildlife habitats in all action alternatives is the reduction of old-growth forest habitat. Impacts to other habitats were reduced by the interdisciplinary design of units prior to alternative formulation. All alternatives result in impacts consistent with the implementation of the TLMP (1979a, as amended) and Alternative P of the TLMP Draft Revision Supplement to the Draft EIS (TLMP Draft Revision 1991a), standards and guidelines.

Table Sum-10 displays the potential reduction in wildlife habitat capabilities, as estimated by habitat capability models, for the key Management Indicator Species (MIS) found in the Upper Carroll Project Area. This table displays the 1954 long-term habitat capability and estimated short-term reduction in habitat capability after potential implementation of the alternatives.

Table Sum-10
Potential Changes in Habitat Capability within the Project Area for MIS in 1997

Species	Habitat Capability		Changes from 1993 by Alternative				
	1954	1995	1	2	3	4	5
Sitka b-t deer	629	389	0	-16	-14	-8	-14
Black bear	75	70	0	-1	-1	-1	-1
Otter	26	17	0	-1	-1	-1	-1
Marten	58	44	0	-4	-3	-3	-4
Hairy woodpecker	501	341	0	-44	-27	-25	-35
Van.Can.goose	86	74	0	-10	-6	-7	-8
Bald eagle	54	40	0	0	0	0	0
Brown creeper	993	497	0	-59	-42	-32	-49
Red squirrel	24,637	22,714	0	-1,316	-740	-780	-1,068
Grey wolf	2.3	1.5	0	0	0	0	0

SOURCE: Matson, 1995

Note: Numbers do not incorporate patch size effectiveness calculations (see the Old-Growth/Biodiversity section)

Forest fragmentation represents a change in the overall forest landscape from large, contiguous blocks of old-growth forest to smaller blocks separated by timber harvest units. Increased amounts of forest fragmentation indicate reduced habitat potential for species which are thought to be dependent on interior old-growth forest habitat. One way to analyze forest fragmentation is to measure the reduction of large, contiguous blocks of old-growth forest as a result of timber harvest. Large and medium sized blocks of old-growth (Naha Roadless Area, Misty Fiords National Monument, Traitor's Cove Retention, Orchard Lake, and Swan Lake) are adjacent to the Project Area. In addition, the Project Area contains a significant amount of old-growth habitat in blocks over 1,000 acres in size. Table Sum-11 displays the number of acres of old-growth habitat in large blocks that will remain after implementation of an alternative.

Summary

Table Sum-11

Effect of Timber Harvest on Forest Fragmentation in Acres

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Acres of lg., unfragmented blocks 100-500 acres remaining after harvest	2,243	2,095	2,189	2,144	2,194
Acres of lg., unfragmented blocks 500-1,000 acres remaining after harvest	2,270	2,035	2,152	2,085	2,021
Acres of lg., unfragmented blocks >1,000 acres remaining after harvest	11,735	10,175	10,874	10,877	10,522
Total Acres of Old Growth remaining after harvest	17,641	15,661	16,654	16,467	16,098

SOURCE: Matson, Nightingale, 1995

Note: Acres include only Volume Class 4 and above

A portion of the Naha old-growth habitat block extends outside of the LUD II area into the Project Area (see Figure Sum-3). This portion of the block is designated as a LUD IV under the current Forest Plan and is available for timber harvest. Alternative 2 proposes to harvest two units totaling 49 acres within this old-growth block. The remaining alternatives do not propose any harvest within this block primarily for economic and wildlife management reasons.

The west side of Carroll Creek represents a small block of unfragmented old-growth habitat located inside the project boundary (see Figure Sum-3). The southwest portion of this area is adjacent to the Naha Block. Alternatives 3 and 4 do not propose any harvest within this block primarily for economic and wildlife management reasons. Alternatives 2 and 5 would harvest 370 and 394 acres respectively from the Carroll Creek block.

Late successional corridors approximately 1/4 mile wide (see Figure Sum-3) that provide connectivity between core areas of unfragmented old-growth habitat were identified. These corridors contain 2,737 acres of which 799 acres are not commercial forest land. Alternative 5 would impact the corridors to the largest degree (157 acres), followed by Alternative 2 (93 acres), Alternative 3 (34 acres), and Alternative 4 (22 acres).

Issue 5. Subsistence Use

Chapter 3 evaluates the potential site-specific effects on subsistence that could result from implementing any of the proposed timber harvest and associated road construction alternatives.

The Tongass Resource Use Cooperative Survey (TRUCS) identified areas which are most heavily used by subsistence households. Based on the TRUCS, the Project Area contains no

high or moderate use subsistence areas. High and moderate use is interpreted to mean greater than 50 households ever used the area for subsistence deer hunting.

Deer hunting is one aspect of subsistence use affected by timber harvest. The Wildlife and Subsistence sections of Chapter 3 discuss the computer models used to estimate the effects of timber harvest on deer habitat capability—both long range and short range. Based on this analysis, Alternative 1 will cause no reduction of deer habitat capability. Among the action alternatives, Alternative 4 would cause the least reduction to deer habitat capabilities (8 deer), while Alternative 2 would reduce deer habitat capabilities the most severely (16 deer) within the Project Area.

Table Sum-12 displays the number of deer the habitat in the WAAs (406 & 510) can support now and at the end of the KPC Long Term Sale (2004). The full WAA habitat capability has not been reduced for the effects of fragmentation.

Table Sum-12

Deer Harvest and Habitat Capability for WAA 406 & 510

Alternative	Habitat Capability Index		Population of Deer Needed to Meet Demand
	1997	2004	1995
1	4,508	4,332	1,040
2	4,492	4,332	1,040
3	4,494	4,332	1,040
4	4,500	4,332	1,040
5	4,494	4,332	1,040

SOURCE: Matson, 1995

Note: Habitat capability for entire WAAs has not been reduced for fragmentation

The Project Area is located within portions of two wildlife Analysis Areas (WAA), 406 and 510. The harvest is 104 deer per year based on ADF&G hunter surveys for both complete WAAs. Approximately 1,040 deer are needed to support this level of deer harvest. Currently (1995) the two full WAAs provide habitat capability for 4,508 deer. The habitat capability through the year 2004 is projected to be 4,332 deer.

Competition for subsistence resources in the Project Area is a scoping issue. Subsistence users are concerned with competition from residents of Ketchikan. Since Ketchikan residents are considered non-rural, this competition can be regulated if it starts to restrict non-rural residents' ability to obtain subsistence resources. Deer habitat capability in WAAs 406 and 510 is presently adequate to sustain all current and projected harvest now and through the year 2040 except for wolf in WAA 510. In the Wildlife Section, the cumulative analysis discussed a potential road connection between the project area and the Ketchikan road system. If such a connection is made, it would significantly increase the amount of rural and non-rural use of the

Summary

area and could increase the amount of competition to the point that there would be a significant restriction in subsistence use of deer and marten in the Project Area.

The Federal Subsistence Board may use its authority to regulate non-rural harvest of deer and has authority to prioritize the harvest of deer among rural residents when necessary to protect the resource. The current deer population level does not require restrictions on non-rural users.

There is no evidence to indicate that availability of salmon, finfish, shellfish, or other food resources to subsistence users would be affected by sport or non-rural harvest. Any increase in competition from non-rural Alaskan residents and nonresidents would not be substantial because of the availability of resources in the immediate vicinity and in the surrounding areas.

The above analysis indicates that the actions proposed in Alternatives 2 through 5 will not represent a significant possibility of a significant restriction on subsistence use of deer, black bear, or otter in the Project Area. Marten harvest in WAA 510 is at the peak of the level that can be sustained. With future reductions of habitat capability for deer and marten, and in light of the fact that Saxman residents' use of the area is underreported for the Project Area, there may be a significant possibility of a significant restriction of subsistence use of marten and deer at some point in the future for all alternatives including the No Action Alternative.

Issue 6. Transportation/ Utility Corridor

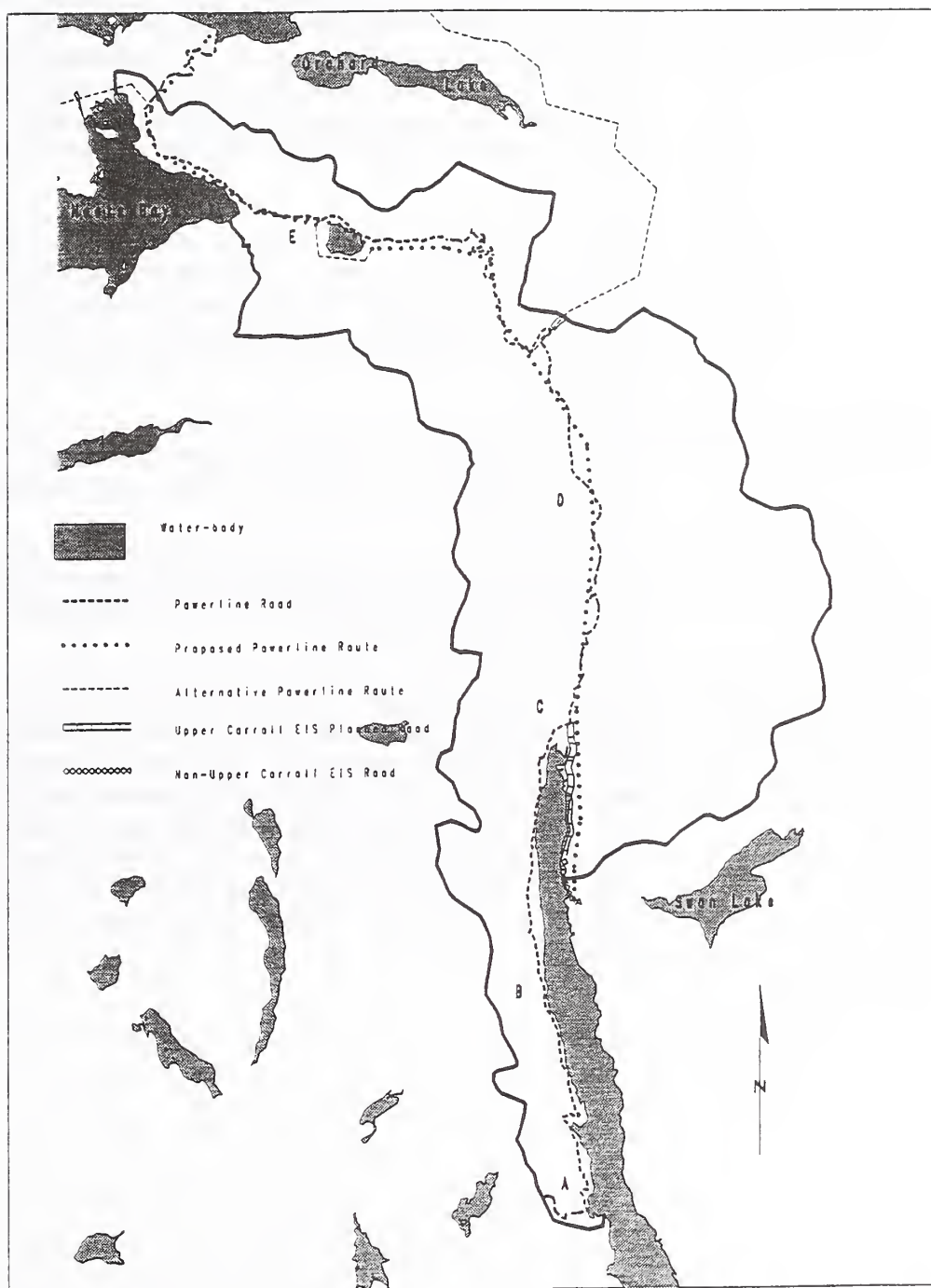
The Tongass Land Management Plan Revision team has mapped the transportation and utility corridors on the Tongass National Forest. The maps show two corridors passing through the Project Area. The Alaska Legislature passed Senate Joint Resolution 40 during the 1992 session. This resolution urges the Forest Service to avoid actions which would preclude the use of any of the transportation and utility corridors identified by an interagency group.

The Upper Carroll Project Area contains approximately 30 to 40 miles of the various potential routes identified to date. The IDT reviewed the possibilities of action being taken on the transportation and utility corridors in the foreseeable future. The review indicated that the corridor could be used for electrical transmission lines within the next decade. The review concluded that the road connections proposed are unlikely within the foreseeable future and that no actions proposed under any alternative would preclude use of any of the transportation and utility corridors.

The "Lake Tyee to Swan Lake Transmission Intertie" (R. W. Beck and Assoc., 1992) presents a feasible electric power transmission line route within the Project Area. The preferred route identified in the R.W. Beck study passes through the Project Area by way of Carroll Creek and Neets Creek drainages (Figure Sum-12).

Figure Sum-12

Utility and Transportation Corridors inside Project Area



Summary

The Ketchikan Gateway Borough and the Alaska Department of Transportation and Public Utilities cooperated in an examination of highway corridor opportunities. This study, Ketchikan - Revillagigedo Island Corridor Study (R&M Engineering, 1992), identified a preferred highway route that passes through the Project Area along the west side of Carroll Inlet, then north along Carroll Creek until the junction with Neets Creek and Orchard Creek. At this point, one potential route heads north outside the Project Area toward Orchard Lake, the other route follows Neets Creek before heading north to Shrimp Bay. As part of the Upper Carroll field reconnaissance, the Forest Service located and flagged on the ground the preliminary route from Shelter Cove to Shrimp Bay. This alternative route uses a ferry terminal at Shrimp Bay as an alternative to the route on the north side of Orchard Lake and some very difficult highway building terrain north of Shrimp Bay.

The IDT considered these routes in alternative formulation and also evaluated them for likelihood of construction within the foreseeable future through other means. For the purpose of this analysis, the reasonably foreseeable time frame over which the indirect effects are estimated is until the end of the Ketchikan Pulp Company (KPC) Long-Term Contract (the year 2004). This determination of reasonably foreseeable is based on the time frame of the KPC contract commitment.

Based on the feasibility and likelihood of funding for power transmission projects within Alaska, the IDT concluded that the construction of the Swan Lake-Lake Tyee powerline was likely within the foreseeable future.

The effects of the possible construction of the power line within the Project Area have primary effects on the visual resource. The clearing of the corridor along the transmission lines would be seen from a number of view points.

The actions proposed in the Project Area could benefit the transmission project by incidental transportation and logistics uses. The construction of the transmission lines across National Forest lands normally requires removal of all merchantable timber felled along the corridor. The road system will allow shorter flights for helicopters removing the timber which would reduce costs. The roads will also allow shorter transportation by helicopter for towers, cable, and other logistics. This activity is expected to result in a reduction of costs. Table Sum-13 displays the miles of road that would be constructed or reconstructed that could potentially serve as access to a possible utility corridor or eventually as a transportation link within the Project Area under each alternative.

Table Sum-13

Potential Transportation/Utility Corridor Access Miles

Alternative	Utility Corridor Miles	Transportation Link Miles
1	0	0
2	23.8	24.7
3	6.4	6.0
4	10.2	9.4
5	14.4	13.8

SOURCE: Oien, 1995

Based on the historical rate of highway development in Southeast Alaska and limited funding, the IDT concluded that a road connection would not reach the project area within the foreseeable future.

The IDT evaluated the action alternatives as requested by Senate Joint Resolution 40, and determined that none of the action alternatives will preclude the identified transportation and utility corridors within the foreseeable future.

The State of Alaska receives 25 percent of the sum of all net receipts from timber sold on National Forest System Lands plus any purchaser road credits. This money is earmarked for public school and road maintenance funding. Table Sum-14 shows the estimated returns to the State of Alaska and the Ketchikan Gateway Borough from the harvest of timber (from this project only) by alternative. Actual returns will be based upon sale volumes and appraised rates and may differ from this estimate, which is based on mid-market rates.

Summary

Table Sum-14

Estimated Returns to the State of Alaska from Sale of Timber*

Alternative	Estimated Volume (MMBF)	Total Receipts (\$Millions)	State of Alaska Returns (\$Millions)	Ketchikan (KGB) Returns ** (\$Millions)
1	0	0	0	0
2	77	12.623	3.156	.142
3	37	8.477	2.119	.095
4	46	10.288	2.572	.116
5	66	14.238	3.560	.160

SOURCE: Marks, 1995

*Based on mid-market rates timber receipts

**Based on historical average percent distribution

Table Sum-15 displays the employment (jobs) and personal income (salaries) associated with each alternative averaged over a four-year period. The jobs and salaries listed include those both directly and indirectly dependent upon the timber industry.

Table Sum-15

Timber Industry Average Annual Employment and Income by Alternative

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Volume Harvested					
Total (MMBF)	0	77	37	46	66
4 Year Avg (MMBF)	0	19	9	12	17
Employment (Jobs)	0	116	57	67	91
Personal Income (Millions \$)	0	27.6	13.5	16.1	21.8

SOURCE: Marks, 1995

All Alternatives provide sufficient volume, in combination with other scheduled offerings, to meet short-term contractual obligations to KPC and/or assist the independent timber purchasers in maintaining timber-related employment in the region. In these alternatives, the total volume (including ROW volume) harvested ranges from 37 MMBF in Alternative 3 to 77 MMBF in Alternative 2. Alternatives 4 and 5 provide 46 MMBF and 66 MMBF respectively. These

volumes could be provided to KPC in harvest offerings that would meet contract requirements and maintain the volume needed to continue production. They could also be sold to independent timber purchasers.

Under Alternative 1, the no-action alternative, none of the employment described above would be supported by timber harvest activity in the Upper Carroll Project Area. This would result in a negative effect on timber harvest employment should local timber purchasers not be able to substitute volume from another source. The effects of Alternative 1 are not predictable and could range from elimination of shifts to partial or even full shutdown of the local mills for an unspecified period of time. Selection of the no-action alternative could also have potential long-term ramifications to the contract holder, the core communities, and ultimately Southeast Alaska, through de-stabilization of the wood products industry.

The projected long-term effects of different harvest levels are contained in the TLMP Revision Supplement to the Draft EIS (TLMP Draft Revision, 1991a). Timber supply analysis indicates it is unlikely that sufficient timber supply would be available within the Upper Carroll Project Area to sustain the scheduled timber harvest through the end of the first rotation (year 2054) when second growth would become widely available for harvest. However, this conclusion depends on future timber values and whether improved or more efficient logging systems are developed to make economically marginal timber more attractive. It also depends on the status of new land use allocations that would reduce the timber base.

None of the alternatives is expected to have a significant direct impact on the commercial fishing, recreation, and tourism industry or related employment.

Direct effects to the marine environment are assumed to occur only from development and use of LTFs, and are limited to the intertidal area affected by rock fill and either the intertidal or subtidal areas potentially affected by accumulations of bark debris.

A total of 5 potential LTF locations were considered for possible development. There are 4 existing LTF sites and 1 potential new site. The maximum number of LTFs that would be utilized under any alternative is 3 (1 new site and 2 existing sites), as there are several possible sites considered for each road system. The final selection of which LTF sites to utilize was based on the interagency guidelines (Alaska Log Transfer Facility Siting, Construction, Operation, and Monitoring/Reporting Guidelines). The U.S. Fish and Wildlife Service and the National Marine Fisheries Service staff conducted subtidal surveys at the sites that appeared to best meet the interagency guidelines. The subtidal survey reports and recommendations which are included as part of Appendix G, were used to further define which of the potential LTF locations were preferable. Table Sum-16 displays the LTFs involved in the various alternatives. See also the detailed alternative maps included with Upper Carroll EIS.

Summary

Table Sum-16

Log Transfer Facilities Required by Alternative and System

LTF Name	LTF Number	Alternative					LTF System
		1	2	3	4	5	
Shrimp Bay	1	N	I	N	N	N	A Frame
Shelter Cove	3	N	I	I	I	I	A Frame
Carroll Inlet #7	4*	N	I	I	I	I	A Frame

SOURCE: Oien, 1995

I = Planned for intermittent use; N = Not planned for use. * New Log Transfer Facilities

Table Sum-17 displays the number of LTFs used or developed, the total acreage of the structural embankment, and the estimated acres to be affected by bark deposition. The combination of the marine habitat covered by the structural embankment and the area potentially covered by bark deposition represents the total loss of marine benthic habitat for each alternative.

Table Sum-17

Marine Benthic Habitat Affected, by Alternative

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Number of LTF Sites	0	3	2	2	2
Structural Embankment (Acres Affected)	0.5	0.7	0.5	0.5	0.5
Bark Deposition (Acres Affected)	0	3.0	2.0	2.0	2.0
Total Acres of Marine Benthic Habitat Affected	0.5	3.7	2.5	2.5	2.5

SOURCE: Oien, 1995

The No-action Alternative has no additional effect on the marine environment, while Alternatives 3, 4, and 5 affect the marine system (2.5 acres) in a similar fashion. Alternative 2 would have the greatest impact (3.7 acres). The loss of habitat is much less than one percent of the available marine habitat in the Project Area. Since all species identified along the subtidal (underwater) survey transects are common throughout Southeast Alaska, it is concluded that there would not

be a significant impact to the marine environment from constructing (or continuing to use) LTFs at the proposed sites.

Mitigation Measures

TLMP Mitigation

The Forest Service uses numerous mitigation and preventive measures in the planning and implementation of land management activities. The application of these measures begins during the planning and design phases of a project. They link to the overall Forest, Ketchikan Administrative Area, and Ranger District management direction and continue through all phases of subsequent forest management. The standards, guidelines, and direction contained in the current TLMP (1979a), the Supplement to the Draft EIS for the TLMP Revision (1991), Alaska Regional Guide, and applicable Forest Service manuals and handbooks have been applied in the development of alternatives and design of harvest units and roads.

Public comment on the Upper Carroll DEIS was helpful in identifying when and where additional mitigation measures should be considered. Unit and road cards are an important tool for implementing the project, as they list standards and guidelines and provide a mechanism for tracking project implementation. Unit and road cards have been developed for each individual unit that occurs in an alternative and appear in Appendix K.

Water Quality And Fish Production

TTRA, BMPs, Water Quality

Mitigation to protect water quality, fish habitat, and wetlands includes application of the Best Management Practices (BMPs) stated in the Soil and Water Conservation Handbook (USDA FSH 2509.22). This handbook provides standard operating procedures for all stream classes. In addition, the TTRA mandates a minimum 100-foot buffer on all Class I streams and on Class II streams that flow directly into Class I streams. The width of this buffer strip may be greater than 100 feet for reasons such as topography, riparian soils, a windfirm boundary, timber stand boundaries, logging system requirements, and varying stream channel locations. In addition, certain Class III streams flow directly into or have been identified as influencing Class I streams. These Class III streams have been buffered to the slope break of the channel or to a windfirm boundary to protect water quality. Split yarding or full suspension was built into the logging and transportation design process, as was partial and full suspension over wetland soils or soils with a higher mass movement potential. Direct in-stream impacts are minimized through road construction timing and fish passage requirements on certain Class I and II streams. Refer to Appendix K (Unit and Road Cards) for the unit-specific stream buffering, suspension, passage, and timing requirements being applied. Application of BMPs and adherence to the TTRA requirements will protect water quality fish habitat and wetlands as well as riparian habitat important to other species such as deer, bear, and furbearers.

Wildlife

Mitigation measures to protect wildlife habitat are a part of the design of the alternatives, including the location of the harvest units and roads. Harvest units and roads are intentionally located away from important wildlife habitats (to the extent practicable) to reduce the effects on wildlife. Beach and estuary habitats are completely avoided by harvest units, while road incursions are minimized to the extent practicable. Where possible, disturbance of important travel corridors is minimized to allow the undisturbed movement of wildlife.

Other measures considered to mitigate impacts include road closures, grass seeding of roadbeds,

Summary

retention of snags where safe to do so, and scheduling of harvest activities which reduce disturbance to bald eagle nesting and rearing activity. Goshawk surveys (vocalizations) have been conducted. If a goshawk or marbled murrelet nest site is located during the layout process it will be protected using the latest standards and guidelines.

Subsistence

Because most subsistence use involves harvesting fish and game, mitigation measures that protect or enhance fish and game resources will also protect and enhance subsistence activities. By placing units and roads away from beach and estuary fringe habitats, and away from salmon bearing streams, mitigation measures were built into each of the alternatives considered in the EIS. Additional subsistence concerns were incorporated into the alternatives to varying degrees.

Recreation

Effects of timber harvest on views from anchorages and known recreational day use areas will be reduced by leaving buffers of timber along the beaches and inland lakes. The proposed visual quality objectives for this plan emphasize the protection of the visual resource as viewed from saltwater. Neets Bay and Carroll Inlet in particular, will reduce the direct effects on visual quality. Stream riparian buffers will protect fisheries habitat and sport anglers use of class I and II streams in the Project Area.

Cultural Resources

Potential effects on cultural resources can be minimized by excluding project activities from most high probability areas (exceptions are LTFs, camps, a small number of units, and access roads to these facilities). The high probability areas were all surveyed in 1994 and 1995, except for exact road locations which cannot be precisely determined until after unit and road layout occurs. There are no known significant cultural sites located within any of the proposed harvest unit boundaries. Types of mitigation measures include avoidance, protective enclosures, monitoring of harvest activities, restrictions on size or road location, and recovery and documentation of materials.

TES Plants

Choris Bog Orchid (*Platanthera chorisana*) is a designated sensitive species. Six populations of this species were discovered in muskeg openings during botanical surveys of the Project Area conducted in 1995. Populations were found within the vicinity of harvest units 20 and 59 and adjacent to a small pond in the Carroll Creek drainage. The primary risk of perturbation to these populations would be through road construction activities. Road locations have been adjusted to avoid direct impacts to known locations of Choris Bog Orchid.

Monitoring

Monitoring activities can be divided into three broad categories: Forest Plan monitoring, routine implementation monitoring, and project-specific effectiveness monitoring. These broad types are discussed in the following sections.

Forest Plan Monitoring

The National Forest Management Act requires that National Forests monitor and evaluate their forest plans (36 CFR 219.11). The significance of this requirement is emphasized by the recent development of a National Monitoring and Evaluation Strategy (Forest Service 1993). The Strategy is designed to focus agency attention and resources on evaluating implementation of forest plans to provide the Forest Service with information necessary to ensure responsive and efficient management of National Forests. Embodied in the National Monitoring and Evaluation Strategy are three principles: (1) evaluation of results will be readily available to the public,

agencies, and other groups; (2) monitoring and evaluation will focus on ecosystems and emphasize interrelationships among biotic and abiotic components; and (3) the strategy will be flexible to meet local needs while encompassing forest, regional, and national requirements.

Three levels of monitoring are incorporated into Forest Plan monitoring and evaluation.

Implementation Monitoring is used to determine if goals, objectives, standards and guidelines, and management prescriptions are implemented as detailed in the Forest Plan and project specifications;

Effectiveness Monitoring is used to determine if goals, objectives, standards and guidelines, and management prescriptions, as designed and implemented, are effective in meeting Forest Plan goals and objectives; and

Validation Monitoring is used to determine whether the data, assumptions, and coefficients used in the development of the Plan are correct.

Most monitoring elements involve the mitigation measures described previously. The mitigation measures are part of a process that includes these three types of monitoring to determine if the measure was implemented and is effective or needs revision. The feedback provided by monitoring results can be used to develop improved methods or additional treatments to ensure that the mitigation will be effective in the future.

An annual monitoring report is prepared by each Administrative Area of the Tongass and incorporated into one report at the end of each year. This report addresses all monitoring questions contained in the applicable Forest Plan; references all monitoring being conducted on the Area/Forest; assesses progress toward achieving the goals and objectives described in the Forest Plan; and either certify that the Forest Plan is sufficient to guide management of the Forest over the next year or propose needed changes and an approach for dealing with those changes.

Forest Plan monitoring is conducted over the entire Forest on a sample basis. Samples may or may not be taken within the Upper Carroll Project Area; however, monitoring results are designed to answer questions regarding the implementation and effectiveness of mitigation within the Project Area. A total of 38 implementation, effectiveness and validation monitoring items are identified in the forest-wide monitoring plan described in the TLMP Draft Revision (1991a). All monitoring is subject to funding and personnel limitations imposed upon the Agency.

Routine implementation monitoring assesses whether the project was implemented as designed and whether or not it complies with the Forest Plan. Planning for routine implementation monitoring began with the preliminary design of harvest units and roads. Specialists used on-the-ground inventories, computer inventories, and aerial photographs to prepare the documents called unit cards for each harvest unit in each of the alternatives. Cards were also prepared for each segment of road. Resource specialists wrote their concerns on the cards and then described how the concerns could be addressed in the design of each unit and road segment. Resource concerns and mitigation measures will be refined further during final layout when specialists will have one more opportunity to revise the unit and road card recommendations. The unit and road card documents will be the basis for determining whether recommendations were implemented for various aspects of the Upper Carroll Project.

**Mitigation/
Monitoring
Feedback Loop**

**Routine
Implementation
Monitoring**

Summary

Routine implementation monitoring is part of the administration of a timber sale contract. The sale administrators and road inspectors ensure that the prescriptions contained on the unit and road cards are incorporated into contract documents and then monitor performance relative to contract requirements.

Effectiveness Monitoring

Effectiveness monitoring seeks answers about the effectiveness of design features or mitigation measures in protecting natural resources and their beneficial uses. Monitoring records will be kept by the responsible staff. Project-specific monitoring tasks are described in detail in Chapter 2.

Validation Monitoring

Validation monitoring is conducted to show if the assumptions or models used in planning are correct. It is usually carried out at the Regional level in conjunction with research. Validation monitoring may or may not occur within the Upper Carroll Project Area since this type of monitoring is built into a Forest-wide Action Plan.

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